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MIND

A QUARTERLY REVIEW OF PSYCHOLOGY AND PHILOSOPHY.

EDITED BY
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CONTENTS.

	PAGE
I.—Meaning of Meaning (Symposium): F. C. S. SCHILLER, BERTRAND RUSSELL, H. H. JOACHIM	385
II.—The Philosophical Aspect of the Theory of Relativity (Symposium): A. S. EDDINGTON, W. D. ROSS, C. D. BROAD, and F. A. LINDEMANN	415
III.—Do We Know Other Minds Mediately or Immediately? JOSHUA C. GREGORY	446
IV.—Some Modern Æstheticians: H. R. MARSHALL	458
V.—Discussion: The Basis of Bosanquet's Logic	472
VI.—Critical Notice: Clement C. J. Webb: *God and Personality. Divine Personality and Human Life:* G. GALLOWAY	478
VII.—New Books	484
VIII.—Philosophical Periodicals	494

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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY

I.—THE MEANING OF 'MEANING'.

A SYMPOSIUM BY F. C. S. SCHILLER, B. RUSSELL and H. H. JOACHIM.

I. BY F. C. S. SCHILLER.

IT has fallen to me to carry on the discussion so brilliantly started by Mr. Russell last year. As he very truly remarked,[1] "logicians have done very little towards explaining the relation called 'meaning'," though this seems a poor reason for relegating it to psychology, where there is little likelihood of getting its paramount importance for logic noticed, even if its own traditional prejudices allowed an adequate description to be given of the psychic character of meaning.

The reason, however, for this neglect of meaning will probably become obvious if we cast a glance over what has hitherto been the chief inspiration of 'logic,' *viz.*, the structure of language, and consider how the chief instruments of philosophic thought have endeavoured to express the notion of meaning. Greek, we then find, is so defective that it can hardly be said to have a vocabulary for the notion at all: it has to rely entirely on periphrases, and gets no nearer to saying 'it means nothing' than declaring that 'it *says* nothing'. Latin is a little better; it has coined the notions of '*significance*' and '*sense*' as aids to the expression of the missing word, and passes them on to the languages descended from, or influenced by, itself. But '*significatio*' is clearly a late and learned word for a special *intensity* of meaning, while '*sensus*' is a manifest misnomer. Meaning belongs to a much higher level of mental development than

[1] *On Propositions: What they are and how they Mean*, p. 7.

sense-perception. Latin notices also the volitional factor in meaning by employing periphrases with *volo* and *valeo*, and these, too, have had a prosperous career.[1] It is only in the Teutonic languages that a specific, antique, and genuinely native vocabulary is found for the notion of 'meaning'. The root 'mean' appears to be common to all of them. In German, however, it has suffered serious degeneration. 'Meinung' has become 'opinion,' though 'meinen' may still, in a context, translate 'mean'.[2] The result is that German is nearly as badly off as the Latin tongues in expressing 'meaning'. 'Bedeutung' is 'significance' or 'interpretation' rather than meaning; 'unmeaning' is 'sinnlos,' 'what does that mean?' is 'was soll das *heissen?*' or '*besagen*,' *i.e.*, properly 'what is it *to be called?* or to '*declare*'. It would seem then that 'meaning' usually baffles language: English alone has a full and specific vocabulary for it, as for the similarly important notion of 'relevance'.[3] Is it not manifestly fitting, therefore, that its significance should be discussed in English?

1.

What sort of an 'entity,' then, is this elusive fact of 'Meaning'? We seem at first to have a choice between conceiving it (1) as an intrinsic property inherent in objects, (2) as a relation, (3) as a contribution to reality made by the subject, and each of these ways of treating it may find support in language.

(1) Language certainly assumes that objects possess, or may possess, meaning *per se*. *Words* especially are always supposed to 'have' meaning of their own might, and stubbornly refuse to have their meaning ignored or altered arbitrarily. All dictionaries are dedicated to the service of this belief. Similarly mental imagery is generally supposed to mean. That physical objects should have intrinsic meaning is more metaphysical and disputable, because it implies an objective teleology. Still it has been extensively assumed. For it shocks the philosophic mind to contemplate objects which are meaningless. Nevertheless Mr. Russell assures us[4] that "sensations do not mean," though images often do. Mr. Russell is not as 'tender-minded' as an academic philosopher should be. He even ventures upon a sagaciously pragmatic suggestion which threatens to upset the whole

[1] The French 'qu'est ce que ça *veut dire?*' is typical.
[2] *E.g.*, 'Was meint er damit?'
[3] *Cf.* MIND, No. 82.
[4] *L.c.*, p. 27.

belief in the intrinsic meaning of objects. Even of words he is willing to affirm that "the meaning is only to be discovered by observing its use: the use *comes first*, and the meaning is distilled out of it".[1] If that is true of meanings so plain and so completely catalogued as those of words, may not *all* meanings be secondary? May not all objects be meaningless *per se*, until they are used to *convey* meaning, and meanings attach themselves to them as barnacles to a ship's bottom?

(2) If meaning is thus an acquired character of objects, it will have to be considered seriously whether it is not a relation, and if so, of what kind. We may note that Mr. Russell does not hesitate to assume that it *is* a relation.[2] But we naturally ask 'A relation between what?' This question Mr. Russell does not find it quite easy to answer. He tries (p. 24) to conceive meaning as a relation between an object and an image, but has to admit that "meaning is to some extent subject to the will". Now this admission is significant: for 'will' is, of course, the very devil in the eyes of any intellectualist philosophy. It keeps breaking in and breaking up the fine-spun fictions of analytical acumen. The intellectualist tradition simply *will* not recognise its existence, but cannot exorcise it, because it has no other way of disposing of the whole side of reality from which its *method* has made abstraction. 'Will' is simply the collective name for the chaotic forces that are left out of account, and so menace the stability of cosmic structures, and the policy of clinging to them.

Historically the matter may be put briefly thus. The traditional method of philosophy, in psychology as well as in logic, goes back to Plato. Now Plato reveals himself in his writings as a powerful and vivid *visualizer*, who naturally thought, therefore, that reality existed to be *contemplated*. Subsequent philosophy readily accepted a dogma that accorded well with the natural shrinking from introspection; it set itself to contemplate, and to look upon everything as an object of contemplation—*from without*. Whatever could not be so regarded, was undervalued, or denied altogether. This is why acts, agents, activities, assumptions, and attitudes are necessarily absent from the panorama of the philosophic spectator of all existence. They are not *objects of contemplation*, and cannot be seen by one whose ambition is to be merely a *spectator*. To exist for such a one, everything has to be transmuted into an *observable* object. But does nothing else exist? Surely no contention can be more gratuitous

[1] MIND, No. 82, p. 19. Italics mine. [2] *Ibid.*, pp. 7, 19.

and grotesque. Surely when the observer argues thus, he has forgotten *himself*, and overlooked the all-pervasive realities which condition all objects and form, as it were, the atmosphere which renders them visible and the light which illumines them.

Nor is there any real reason why they should be ignored. Our method of interpretation can just as well, and as legitimately, proceed *from within* outwards. 'Introspection' is possible, though the word is sadly tainted with the delusion that, to be known, the interior of the soul must be 'regarded' as 'consisting' of 'objects' to be viewed externally. Whereas *as experienced from within* 'objects' are by no means the substantial core of reality, but rather secondary, derivative and instrumental; they are the burden of a swirling tide of life, the products of an arduous activity of selective recognition, the values, means and ends achieved by purposive striving. True, no psychologists, not even those who have struggled most sturdily against the contemplative tradition and insisted on the activity and continuity of mental life,[1] have quite emancipated themselves from the method of turning the eye of the soul outwards; but it has failed so long and so egregiously that it ought to be discarded.

Mr. Russell has provided the last exemplification of this failure. He has loyally tried to account for the facts in the traditional way, and has failed as decisively as Hume and Mill. In order to comply with the imperious postulate that nothing shall be treated as real that cannot be regarded as an observable object, he has even consented to change his own doctrine. "I have to confess," he says (p. 25), "that the theory which analyses a presentation into act and object no longer satisfies me. The act or subject is schematically convenient, but not empirically *discoverable*.[2] . . . I am at a loss to discover any actual *phenomenon*[2] which could be called an 'act' and could be *regarded*[2] as a *constituent*[2] of a presentation." And he encounters the *mauvais pas* of the method

[1] Thus even James tries to reduce the self to strain-sensations (*i.e.*, 'objects'), relegates meaning to the 'psychic fringe,' and in the very act of recognising it as "an entirely peculiar element of thought" and an "absolutely positive sort of feeling" represents it as "evanescent and transitive" (*Princ. of Psych.*, I., 472), and so gives the lie to the plain fact that meaning is far more persistent in experience than the objects meant. Similarly McDougall, though he calls meaning "the essential part of consciousness," accuses it of 'eluding introspection' and represents it as supervening upon "sensory content," *i.e.*, objects which meant nothing till it came (*Body and Mind*, p. 303). Surely this inverts the real relation: inert 'objects' are selected and swept up by a current of meaning which is exploring reality for means to its ends.

[2] Italics mine.

(which has hitherto led to the confession of failure) that if the mind is conceived as a series of feelings we must accept "the paradox that something which *ex hypothesi* is but a series of feelings can be aware of itself as a series,"[1] with the heroic declaration that "the belief in a succession may quite well be itself a succession" (p. 42). If nevertheless he is driven to admit a volitional factor in meaning, and to add to the 'contents' of propositions "propositional attitudes" which "do not form part of the proposition, *i.e.*, of the content" (p. 30), we may be sure that he is yielding to the sheer pressure of the facts: the more so when we notice that his examples of "propositional attitudes," memory, expectation and desire, are precisely the terms by which his predecessors sought to atone for their destruction of all the principles that could be conceived to weld together the serial succession of 'contents' into the biography of a continuous spirit.[2] But memory, expectation and desire are facts to which the method common to Hume, Mill and Russell has no right to appeal: they are activities which unite and fuse into significant wholes the fictitious series of 'sensations,' 'images' and other 'objects,' inconsistently and inexplicably 'connected' by static 'relations'. Their constant recurrence, therefore, in this psychological 'analysis' is as much a confession of failure as is the recognition of 'propositional attitudes' or of contributions to 'meaning' rooted in the 'will'.

(3) We are driven then to consider a third alternative. What if Meaning be neither an inherent property of objects nor a static 'relation' between objects at all, not even between the object and a subject, but essentially an *activity* or *attitude* taken up towards objects by a subject and energetically projected into them like an *a* particle, until they, too, grow active and begin to radiate with 'meaning'? Here, if anywhere, would seem to lie the clue to the mystery of 'meaning'.

To inquire thus means a fundamental change in the method of psychological analysis. It means the substitution of the standpoint of the *agent* for that of the *spectator*. It means voluntarism, instead of intellectualism. But abstractly it is as possible and as valid a method as the other, and we have good reason to anticipate that it will prove more potent and more applicable to the facts.

[1] *Examination of Hamilton*, p. 248.

[2] *Cf.* Hume's *Treatise* (ed. Selby-Bigge), pp. 260 f., 636; Mill's *Hamilton*, pp. 247, 260, 262.

2.

Accordingly such proves to be the case. When we suspend our intellectualistic bias, the facts of meaning at once yield overwhelming evidence in favour of the voluntarist interpretation. If 'meaning' is originally a demand *we* make upon our experience, we can, in the first place, account excellently for the all-pervasiveness of Meaning. For we shall then insist that whatever our attention lights upon *shall have* a meaning, and shall forever be inquiring *what* its meaning is.

Hence (1) the assumption of meaning is practically universal. An *unmeaning* flow of experiences is surely the rarest and most unheard-of of events in a normal mind. If we can be said to experience anything that we do *not* take to have a meaning, it is to be found only in the phantasmagoria of some dreams: and even towards dreams the psychoanalysts have shown that science cannot now maintain an ascetic attitude. The common man has never been willing to believe that anything that happened to him could be void of meaning. He is frankly a Nebuchadnezzar, who wants to have even his forgotten dreams interpreted: unfortunately the psychologists have tended to pass the problem of Meaning on to the logicians, and these do not show themselves to be Daniels when they come to Judgment and endeavour to expound the meaning of that (or any other) logical structure.

(2) Meaning, then, is not only universally present, but universally decisive, not only real, but really important. It is not an insignificant accessory to a substantive process of objective change. It is vital and central and all-sustaining. It is the source of the energy which animates and directs the whole process, selects the objects of attention, determines their function and value. All this becomes evident the moment our psychology consents to leave the attitude of the spectator for that of the agent, or to reflect that even the former presupposed an *act* which assumed it. It then appears that there is no reason whatever to be apologetic about meaning, to minimise its importance, to exaggerate the difficulty of discerning it, to drive it into the background, to relegate it to the psychic 'fringe,' to try to curry favour with the advocates of a radically different method of psychological description by disparaging it as 'vague,' 'obscure' or 'evanescent'. The meaning he intends is usually what an agent is most clearly conscious of, and what persists most stubbornly, through the various forms of expression he may successively attempt. It is true that meaning is essentially

progressive; it promptly ebbs from the various instruments it has utilised for its expression, when they have served their purpose; but it is not true that meaning itself is transitory. It passes lightly on, from one object to another, but it remains a permanent reality of which the subject, *conceived as active*, can never grow oblivious. In Hume's language, therefore, Meaning forms the true 'theatre' of mental operations, the stage on which the various sorts of 'objects' make their brief appearances and play their little parts.

(3) The view of Meaning I have advocated may be summed up in the phrase that *Meaning is essentially personal;* and so it must cause endless trouble to a logic or a psychology built on the assumption that it is *de rigueur* to abstract from personality. What anything means depends on *who* means it, when, where, why, on what occasion, in what context, with what purpose, with what success. A real meaning is as surely rooted in a definite spot in an individual soul as any flower in its bed. It is as particular as any fact can be, and cannot be transplanted to another situation without the risk of a fatal loss or change of meaning. Hence it is incumbent on every one who concerns himself with meaning to beware of stopping short at the conventional meaning of the words and to press on to the meaning of the man who uses them.

(4) This, moreover, he can always do. For a question of Meaning is always a question of fact, as is the question of its communication or understanding. Thus the meaning of any doctrine can always be ascertained (in principle), if we can communicate with its maker and understand what *he* meant. For this is the historic fact which started the development of his doctrine. It is the duty of philosophers then to ascertain this primary fact, the personal meaning, *as it was meant;* after that they may proceed to assimilate and 'understand' it. For it is sometimes possible to communicate meaning, though it must be confessed that philosophers are not very expert in exploiting this possibility.

It should be noted further that to declare that meaning is personal is to imply that it is relative to the *whole* personality, and is not a purely intellectual affair. It is deplorable, but true, that intellectual considerations count for very little in the total reactions of the great majority—even of those who believe themselves to be following the light of reason; nor is any of the artificial simplifications to which the sciences initially have recourse more productive of confusion and contention than the facile assumption that when two persons *say* the same things they must also *mean* the same things.

They usually *don't*, as appears when they make a real effort to understand each other. Hence it is the rule rather than the exception that the same 'proposition' should have very different meanings in the context of two minds with different temperaments, histories and prejudices, and vast masses of perfectly futile controversy would be cleared away if more attention were paid to the idiosyncrasies of the parties concerned and to the natural difficulties in the way of an effective communication of meaning.

3.

From this account of what Meaning is, it follows that it is *not* quite a number of things it has usually been supposed to be. Thus, if the whole course of experience is full of meaning *a priori*, that is simply because *we assume* that it means, it follows that the meaning of the objects occurring in it cannot be inherent, but must be derivative. For being bathed in a flood of personal meaning, they gradually get stained with a stable colouring, which is determined by the uses to which they have been put and the idiosyncrasy of the user. From this fate there is no escape either for words, mental images or objects; but it will be convenient to consider these cases separately. In each case it will be found that though they tend to acquire stable meaning in consequence of habitual use, it is not possible to fix this meaning absolutely and irrespective of their use. There always remains a margin of elasticity about it which shows that it is false in principle to treat the meaning in abstraction from the use, and the use in abstraction from the *particular occasion* of the use.

(1) That *words* have stable meanings demanding scientific recognition is sufficiently attested by the existence of *dictionaries*, which are catalogues of the meanings on record. At the same time the fact that dictionaries also grow antiquated proves that the meanings of words continue to grow in spite of them. Actually no word can have its meaning so fixed, whether by a dictionary or by a definition, that it cannot work loose. So though the discoverers of new truths and the makers of new values often have reason to complain of the stubborn conservatism of words, the corruptors of language, from the ignoramus to the humourist, triumph easily over the fixity of their meanings. An analogy, a metaphor, a sarcasm, a joke, or even a blunder, will easily do the trick.[1]

[1] Thus logicians might be invited to take note that 'I don't think' has become an emphatic form of affirmation, and that in American to 'hypothecate' means 'to frame hypotheses,' and no longer to 'pawn,' and so fills a lacuna in English.

Thus whether we use words as counters or as coins, we are always confronted with problems of change and of exchange.

(2) Mental images undoubtedly occur, and carry meaning. But, as Mr. Russell is careful to note, they are usually so vague that they can easily accommodate themselves to almost any meaning. A mental image, though it is in itself a particular psychic fact, can stand for, and mean, either a particular object, or a 'universal,' or any number of objects other than that of which it is 'the' meaning. When Prof. Santayana lately wrote about 'German philosophy,' he no doubt had his colleague Münsterberg in mind; but his image might just as easily have called up not 'German philosophy' universally, but another of the tribe; or he might have summoned a more inhuman image to typify his topic. The mental image of a dignified old man may mean a friend or a god, and among gods may stand for Jahveh or Jupiter, for Ormuzd or Odin, *au choix*. Mental images then are very obliging; you can mean with them pretty nearly what you like. Which no doubt is one reason why we are so ready to employ them.

There is one thing, however, which it is impossible, or at least improper, to do with them. We cannot make them pivotal from our theory of Meaning. Yet this is the very thing which has usually been attempted. It has been supposed that mental images could possess inherent meanings, and that by associating and compounding these, more or less mechanically, the meanings of judgments could be explained. Or, as Mr. Russell puts it, that "the 'meaning' of images is the simplest kind of meaning because images resemble what they mean, whereas words, as a rule, do not," that "thus the problem of the meaning of words is reduced to the problem of the meaning of images" (p. 22), and that "sensations and images, suitably related," are "a sufficient stuff out of which to compose beliefs" (p. 28).

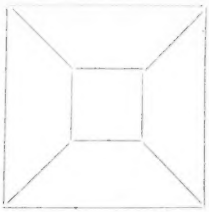
Now this is an assumption I am anxious to challenge. There seems to be no justification for it whatever, and much that tells against it. It is merely a deduction from the theory that objects alone, and no acts, may be recognised by psychology, and all the facts to which it appeals decide against it.

It presupposes (1) that all have mental images, because they are essential to meaning and no one can mean without them; yet it is admitted that empirically imagery is indiscoverable in many excellent reasoners, without damage or detriment to their meaning. (2) It incites to the inference that the more vivid the imagery, the clearer the meaning; but no such correlation can be observed. Meaning and imagery do not vary concomitantly, but rather inversely. (3) It would justify

the deduction that the nature of the meaning must be profoundly affected by the nature of the imagery which conveys it; but no such influence can be traced. On the contrary with the same meaning different images may be conjoined, while different meanings may be conveyed by the same image. Actually any kind of meaning is found to be associated with any kind of imagery and no type of imagery appears to have, as such, any advantage over any other. Beyond the fact that meaning and imagery are both frequent occurrences in minds, no logical connexion seems traceable between them.

Does not the evidence, then, point irresistibly to the interpretation that the association of Meaning and imagery is essentially fortuitous, and due, probably, to the irradiation of the dynamic meaning-activity over the mental contents and idiosyncrasies on which it happens to impinge? If so, one would expect the value of the meaning to depend essentially on the intrinsic energy of the meaning-activity and its success in attaining its objects, and to vary independently of the imagery, which, whether present or not, would be irrelevant, and would add nothing indispensable to the meaning. The belief that the imagery is essential is merely a consequence of this false psychological method that refuses to recognise activities which are not 'objects'.

(3) Meaning sits more lightly on objects and stains them less deeply and permanently than images and words. This is established by the fact that it is not uncommon to inquire what an object means, and to prosecute elaborate researches into its unknown meaning. This implies, doubtless, that it 'has' a meaning; but this assumption is only methodological, and it proves also that its meaning is not on the surface, and has to be sought out. At the opposite end of the scale we find objects whose meaning is so plainly imposed on them by us that we can vary it at pleasure, and make the object mean one thing or another, as we will. Thus in this simple diagram



the central square can be seen as flat, as receding or as projecting, as we will. Philosophy is indebted to the psychologists for the discovery of many such cases, though their

importance for knowledge has hardly been appreciated adequately. Between these extremes, of meaning imposed at will and of meaning that is still a matter of faith, there are masses of objects which have more or less inherent and stable meanings. But it is hardly scientific to contemplate these meanings as if they were entirely intrinsic, and had not been attached to the objects by our past dealings with them.

(4) Meaning is not dependent on *expression*. No doubt it normally finds expression by some means or other, or, if it does not, becomes suspect, like the 'pure' science that has *no* applications and so becomes indistinguishable from an arbitrary game, or the well-meaning man who never *does* the good he *means*. The ineffable and inexpressible are rightly suspected of being eulogistic descriptions of the null and void. Still, meaning is the primary fact and expression is secondary. Hence it is possible to have the meaning-experience, to assume the meaning-attitude, *without* using words or any other sort of sign or utterance.

This comes out most clearly perhaps in cases of *obstructed* expression. We are never more purely or intensely conscious of meaning than when we find ourselves totally unable to express our meaning. Who has not felt the agony of trying vainly to express his meaning in a foreign tongue, or to utter an elusive word that hovers on his tongue-tip, but obstinately refuses to pass his ἕρκος ὀδόντων? Not a few also have experienced various stages of aphasia, which stretch from trivial 'slips of the tongue' that fail to express what we meant to total inhibition of all utterance. Or again the primacy of the meaning-experience is attested by the fact that a mind may be full of meaning and yet empty of any object meant. As James says,[1] "What kind of a mental fact is a man's intention of saying a thing before he has said it? It is an entirely definite intention, distinct from all other intentions, an absolutely distinct state of consciousness, therefore; and yet how much of it consists of definite sensorial images? . . . It has a nature of its own of the most positive sort and yet . . . the intention *to-say-so-and-so* is the only name it can receive." Consider again James's description of the 'intensely active gap' that fills consciousness when "we try to recall a forgotten name".[2] It is "no mere gap. . . . A sort of wraith of the name is in it, beckoning us in a given direction, making us at moments tingle with the sense of our closeness, and then letting us sink back without the longed-for term. If wrong names are proposed to us, this singularly

[1] *Psychology*, I., p. 253. [2] *Ibid.*, p. 251.

definite gap acts immediately so as to negate them. They do not fit into its mould. And the gap of one word does not feel like the gap of another, all empty of content as both might seem."

The apparent paradox that meaning should be most intense when it is most obstructed is not unparalleled. Just as the strength of a current is revealed when it eddies over the rocks that obstruct its course, so the reality of our activities is manifested to us by the resistance they encounter. Thus what philosophers are wont to call 'thought' is essentially a phenomenon of obstructed perception, 'will' is an incident of obstructed action, and 'research' of obstructed cognition. It is natural enough, therefore, that cases of obstructed expression should yield the purest and intensest consciousness of meaning.

How independent of expression meaning essentially is, we may realise also when we observe the flexibility of the instruments of expression when they are plunged in the stream of meaning. Words in particular are by no means as resistant as verbalists imagine. They do not maintain their meaning against the disintegrating influences of usage. What creed or formula means now what it meant originally to its maker? That irony or jest, or even ignorance and blundering, can transmute the meaning of a word is theoretically admitted; but how few realise that the least change of emphasis, intonation or context may change its normal meaning utterly. The verbal form of a sentence is hardly a better guide to its meaning in use than the etymology[1] of the words. A look, a nod, a wink, a start may reverse their ostensible meaning and convey the actual meaning better than a volume of words. As Prof. Stout has remarked the meaning of 'I am going home' is utterly different according as it is said by a man in the street or on his death-bed, while the 'Greeks' who are feared are probably different every time *Timeo Danaos* is quoted. Why, then, should logicians be surprised to find that the commonest meaning of 'it is a fine day' is 'let us talk,' and of 'not at home' is 'won't see you,' or that 'it is too sacred' mostly means 'I will not trouble to inquire,' and 'I disbelieve' = 'I have not read'? The control of verbal by personal meaning is surely so plain that we may leave this topic with the expression of an earnest hope that the problem of meaning will not long continue to remain too 'sacred' to be pried into by the logicians.

[1] Which itself is not a 'study of truth,' even though ἔτυμος means 'true'.

There is, however, one more question I should like to bring to the notice of Mr. Russell. It is the intimate connexion between *meaning* and *value*. To attribute meaning and to attribute value seem to be closely akin and almost the same thing. Both are personal attitudes and activities, which in practice seem inseparable, though, theoretically, meaning may perhaps be said to be prior to value and a condition thereof. Both are all-pervasive, *i.e.*, both form atmospheres through which all 'objects' are observed. Both are 'subjective' in origin, *i.e.*, are attitudes expressive of total personality. Both are individual, *i.e.*, the meanings and values a man recognizes are primarily those which appeal to him, and may be peculiar to him. Thus there is always for every one a problem of *communication;* because he never knows initially whether the meanings and values he attributes to objects in the common world are shared, understood or appreciated by others. But whenever communication is achieved and agreement reached, both meanings and values become 'objective,' and may even become cogent and coercive. They then not only grow common and win general recognition, but are projected into objects and regarded as inhering in them. Objects are thereupon said to 'possess' or 'have' value or meaning *per se*, and whether anyone knows or recognizes it or not.

All of which it would of course be possible to illustrate at length; but I will content myself with a single, and to my mind also singular, corollary. If value is taken to be a 'tertiary predicate,' a human addition to reality, which the austere impersonality of science endeavours to erase from the picture of the universe, and if, nevertheless, meaning and value are indissolubly bound up together, will it not follow that in cancelling value we inevitably cancel also meaning? And after this how can we flatter science that it means anything or can discover meaning anywhere? Thus a meaningless logic helplessly contemplating a meaningless reality would seem to be the legitimate outcome of a consistent attempt to abstract from the personality of the knower in our account of knowledge and reality. And to me at least this situation tends strongly to suggest a doubt whether the meaning of such a philosophy can be right.

I trust I have succeeded in attacking Mr. Russell's stimulating paper on a sufficiently wide front to provide abundant sport for the spectators of our philosophical *battues*, and adequate temptations for the intervention of those who are not content to be merely spectators.

II. By Bertrand Russell.

In replying to Dr. Schiller, I am anxious first of all to make clear what are the points as to which I am in agreement with him. I agree with him in not regarding meaning as "an intrinsic property inherent in objects". I agree also that "meaning is essentially personal," though I disagree as to the nature of personality. When Dr. Schiller says: "What anything means depends on *who* means it, when, where, why," etc., he is saying something which must be true if there is truth in the theory of meaning advocated in the paper which he is criticising. It follows equally from that theory that "meaning is not a purely intellectual affair"—provided, at least, that any meaning can be found for the word "intellectual". So far as I can discover, this word means merely "good" or "bad" according to the philosopher who uses it; in Dr. Schiller's mouth, it means "bad". His statement therefore may be translated: "Meaning is not wholly evil"—a proposition with which I find myself in agreement, since I am convinced that Dr. Schiller, at any rate, means *well*.

It is time, however, to pass to points of disagreement. I will begin with what Dr. Schiller says as to the meaning of images [III, (2)]. His arguments against the view that the meaning of words is derived from that of images are three. He says:—

"It presupposes (1) that all have mental images because they are essential to meaning, and no one can mean without them; yet it is admitted that empirically imagery is indiscoverable in many excellent reasoners, without damage or detriment to their meaning."

This objection ignores the history of the individual. The essence of meaning lies in the causal efficacy of that which has meaning, and this causal efficacy is, in the main, a result of habit. A word, through association, acquires the same causal efficacy as an image having the same meaning; habit causes it to have this efficacy directly, without the intermediary of the image. But that does not prove that the image could have been dispensed with originally. Dancing bears dance when they hear a tune which they formerly heard when placed upon an uncomfortably hot floor; but that does not prove that the tune alone can account for their dancing. The tune corresponds to the words, the hot floor to the image; in each case a habit has been formed through the former presence of an intermediate link which is now no longer required.

Dr. Schiller's second argument on this subject is as follows:—

"It incites to the inference that the more vivid the imagery, the clearer the meaning; but no such correlation can be observed. Meaning and imagery do not vary concomitantly, but rather inversely."

I suspect Dr. Schiller, in this argument, of an error which is somewhat unusual with him, namely a preference of abstract verbal precision to vitality and concreteness. Suppose you describe Niagara to two people who have never seen it, one a painter who translates all your words into images, the other a physicist whose thoughts are led by your description to geology and hydro-dynamical formulæ. The above argument commits Dr. Schiller to the view that the physicist has a clearer apprehension of your meaning than the artist; yet this view seems contrary to his whole philosophy. It is, of course, true that words have great advantages over images as bearers of meaning: first, they are more subject to voluntary control; secondly, they are communicable. The second of these is the more important in the present connexion. Precision in the meaning of words, so far as it exists, is a social product, due in the main to the fact that if we use words in a sense different from that in which our hearer understands them we produce effects which we do not desire (except in diplomacy). Thus the greater precision in the meaning of words as compared with images is by no means a proof that they are the more primitive bearers of meaning.

Dr. Schiller's third argument is:—

"It would justify the deduction that the nature of the meaning must be profoundly affected by the nature of the imagery which conveys it; but no such influence can be traced. On the contrary, with the same meaning different images may be conjoined, while different meanings may be conveyed by the same image."

I cannot understand how this can possibly be supposed to be an argument against my position, which, on the contrary, would lead one to expect this result—a result which I myself pointed out (p. 23). If the meaning of an image depends, as I maintain, upon its associations, it is clear that the meaning will be different in different people, or in one person at different times, if, as is to be presumed, the associations of the image are different on the two occasions. Here again, the comparative fixity in the meaning of words as opposed to images is due to their social employment.

I come next to a more fundamental question. Dr. Schiller says: "The belief that the imagery is essential is merely a consequence of the false psychological method that refuses to

recognise activities which are not 'objects'." This is connected with an earlier passage in which he says that 'will' is "the very devil in the eyes of any intellectualist philosophy". He maintains that traditional philosophy errs in regarding everything as an object of contemplation "*from without*," and that "this is why acts, agents, activities, assumptions and attitudes are necessarily absent from the panorama of the philosophic spectator of all existence. They are not *objects of contemplation*, and cannot be seen by one whose ambition is to be merely a *spectator*. To exist for such a one, everything has to be transmuted into an *observable* object. But does nothing else exist? Surely no contention can be more gratuitous and grotesque. Surely when the observer argues thus, he has forgotten *himself*."

This passage raises so many issues that it is difficult to know where to begin. To take small points first: I have not the faintest hostility to the will, and do not by any means regard it as "the devil" (except in those who are devilish). Nor, on the other hand, do I call myself an "intellectualist". I do not know what one should mean by the word "intellect," but I suspect that one should mean certain habits in the use of words. I have no mystical reverence for these habits, or for anything else in Man. I try to use such intellect as I possess when I think, just as I use my legs in walking and my fingers in writing. But the fact that I use my fingers in writing philosophy does not make me a member of some special digitatory school of philosophers. It is perhaps fair to call (say) Hegel an intellectualist, since he believed in an affinity between the cosmic process and the process of thought; but the term can hardly be applied to one who regards thought as merely one among natural processes, and hopes that it may be explained some day in terms of physics.

When Dr. Schiller asks whether it is rational to deny the existence of things that cannot be observed, we must certainly answer that it is irrational. I should be the last to maintain that nothing unobservable exists. And Dr. Schiller would be the first to criticise me for having admitted, in constructing the world of physics, that there *may* be physical particulars which are not experienced. He will postulate only such unobservable entities as he happens to desire; as regards others, he will be rigidly empirical. This is quite consistent with pragmatism: I am merely pointing out that Dr. Schiller's position requires pragmatism to justify it. My own position is more agnostic. I am not prepared either to affirm or to deny the existence of entities which can neither be observed nor inferred from observable ones. When I refuse to assert the

existence of such entities, I emphatically do not mean to deny their existence, but merely to abstain from an opinion either way.

Dr. Schiller maintains, on the contrary, that he knows of the existence of certain entities which cannot be observed or made into objects of contemplation. He knows of "all-pervasive realities which condition all objects and form, as it were, the atmosphere which renders them visible and the light which illumines them". But how can this be? Do not his very words turn them into objects of contemplation? Does not the very mention of them as "all-pervasive realities" place him outside them, at least in imagination, and thus imply that they are not *all*-pervasive? If my personality colours all that I observe—a view which I neither assert nor deny—then, clearly, I cannot know anything of the way in which it colours my objects. A subjectivity which can be put into words is a half-hearted subjectivity; taken seriously, it defeats itself. It becomes ineffable and inexpressible, and, as Dr. Schiller says, "the ineffable and inexpressible are rightly suspected of being eulogistic descriptions of the null and void".

It is much to be regretted that Dr. Schiller has not told us how he acquired knowledge of these unobservable entities, which, according to him, afford the clue to meaning and to everything else. For my part, I do not regard the problem of meaning as one requiring such special methods as are commonly called "philosophical". I believe that there is one method of acquiring knowledge, the method of science; and that all specially "philosophical" methods serve only the purpose of concealing ignorance. In science, we are confined to the entities we can observe, not on any *a priori* ground, nor because we hold that there are no other entities, but merely because the others, if any, are by definition unknown. Now meaning is an observable property of observable entities, and must be amenable to scientific treatment. My object has been to endeavour to construct a theory of meaning after the model of scientific theories, not on the lines of traditional philosophy. It is this, at bottom, that causes the divergence between Dr. Schiller's views and mine.

All the words in which Dr. Schiller endeavours to describe his unobservable entities imply that after all he can observe them. "*As experienced from within*," he says, "'objects' are by no means the substantial core of reality, but rather secondary, derivative and instrumental, the burden of a swirling tide of life, the product of an arduous activity of selective recognition, the values, means and ends achieved

by purposive striving." Why not? But that only means that Dr. Schiller substitutes new objects for the old ones: the swirling tide of life, arduous activity, purposive striving, replace tables and chairs. I should be the last to maintain that tables and chairs are part of the "substantial core of reality," a view which is the opposite of my own. I have my doubts also about the "swirling tide of life," since I should wish to know what it is that swirls, and whether the equations of hydrodynamics can be applied. But that is not my point. My point is that Dr. Schiller makes these things into objects, and seems to me, like Herbert Spencer, to know more than he should about the Unknowable.

It is true that he speaks of these things as "experienced from within". The word "experienced" is a blessed word, calculated to create a smoke-screen about any position. But I confess I am at a loss to know how anything can be experienced without being an object, or, if it can, how it can come to be mentioned. I am also much puzzled by the words "within" and "without". I understand the words, when physics and space have been constructed, as applying to what is within or without my skin. I perfectly understand that when I have a stomach-ache it is "experienced from within," whereas when my hat blows off it is "experienced from without". But I do not understand any other sense of the words, and I do not believe they have any other sense. I believe that the things "experienced from within" are the things that happen inside the skin, and that the words are not capable of any other meaning. I believe that thought and will and purpose and the rest of the apparatus of our "mental" life are reducible to elements which concern my inside in just the same sense in which a stomach-ache does, and in no other.

Dr. Schiller's discussion has emphasised the part played by images in my theory of meaning. But as this is by no means the most vital or characteristic point in my theory, I think it will be wise to state that theory briefly in an uncontroversial way; the more so as the explanation of meaning was only one of the purposes of the paper which Dr. Schiller is criticising.

Meaning, in my view, is a characteristic of "signs," and "signs" are sensible (or imaginal) phenomena which cause actions appropriate, not to themselves, but to something else with which they are associated. The possibility of action with reference to what is not sensibly present is one of the things that might be held to characterise mind. Let us take first a very elementary example. Suppose you are in a

familiar room at night, and suddenly the light goes out, you will be able to find your way to the door without much difficulty by means of the picture of the room which you have in your mind. In this case visual images serve, somewhat imperfectly it is true, the purpose which visual sensations would otherwise serve. Again, words heard or read enable you to act with reference to the matters about which they give information; here again, a present sensible (or imaginal) stimulus, in virtue of habits formed in the past, enables you to act with reference to an object which is not sensibly present. The whole essence of the practical efficacy of "thought" consists in sensitiveness to *signs*: the sensible (or imaginal) presence of A, which is a sign of the present or future existence of B, enables us to act in a manner appropriate to B. Of this, words are the supreme example, since their effects as signs are prodigious, while their intrinsic interest as sensible occurrences on their own account is usually very slight.

The operation of signs may or may not be accompanied by consciousness. If a sensible stimulus A calls up an image of B, and we then act with reference to B, we have what may be called consciousness of B. But habit may enable us to act in a manner appropriate to B as soon as A appears, without having an image of B. In that case, although A operates as a sign, it operates without the help of consciousness. Broadly speaking, a very familiar sign tends to operate directly in this manner, and the intervention of consciousness marks an imperfectly established habit.

We may give more precision to the definition of meaning by introducing the notion of "mnemic causation". By this I mean that sort of causation in which the past history of the animal in question is an essential factor—the sort studied by Semon in his two books *Die Mneme* and *Die mnemischen Empfindnugen*. This is the sort exemplified in the fact that a burnt child fears the fire. I am not concerned for the present with the question whether mnemic causation can be reduced to ordinary physical causation in nervous tissue; I am only concerned with the fact that *prima facie* it marks out certain peculiarities in the behaviour of animals, and, to a lesser degree, of plants.

We find sometimes that, *in mnemic causation*, an image or word, as stimulus, has the same effect (or very nearly the same effect) as would belong to some object, say a certain dog. (Other things besides words and images may have this characteristic, and in that case will have meaning; but words and images are the most notable examples). In that case, we

say that the image or word "means" that object. In other cases, the mnemic effects are not all those of one object, such as a particular dog, but only those shared by all objects of a certain kind, *e.g.*, by all dogs. In this case, the meaning of the word or image is general: it means the whole kind. Generality and particularity are a matter of degree. If two particulars differ sufficiently little, their mnemic effects will be the same; therefore no image or word can mean the one as opposed to the other; this sets a bound to the particularity of meaning. On the other hand, the mnemic effects of a number of sufficiently dissimilar objects will have nothing discoverable in common; hence a word which aims at complete generality, such as "entity" for example, will have to be devoid of mnemic effects, and therefore of meaning. In practice, this is not the case: such words have *verbal* associations, the learning of which constitutes the study of metaphysics.

We may therefore lay down the following definitions:—

(1) A "sign" is an occurrence which, through mnemic causation, has mnemic effects (not, in general, other effects) appropriate (from the point of view of the animal's instincts and desires) to some other occurrence or set of occurrences with which it is apt to be associated.

(2) In such a case, the other occurrence or set of occurrences is the "meaning" of the occurrence which is a sign.

III. By H. H. Joachim.

Though I have resolved to stand aside from the discussion between Dr. Schiller and Mr. Russell, I fully appreciate its importance. Thus—to mention but two of the many grave problems in dispute—is Mr. Russell right in thinking that his intellect is only "a certain habit in the use of words"? And is the meaning of Dr. Schiller's paper, as he himself suggests, "essentially an activity and attitude" which he has "taken up towards objects and energetically projected into them like an *a* particle . . ."? If only I could convince myself that both these questions must be answered in the affirmative, a brilliant light would be thrown on much that is at present obscure to me in the writings of both disputants.

But neither Mr. Russell nor Dr. Schiller profess to have *proved* these interesting suggestions. And since I distrust my own capacity to decide such abstruse and highly speculative issues, I propose to devote myself to a less ambitious task, and to examine (as minutely as I can within the space allotted

to me) certain perplexing features in Mr. Russell's theory of "meaning" and "belief". For the more I study his Article[1] and his Reply to Dr. Schiller, the more I am perplexed, bewildered and dismayed. It is not merely that I think him mistaken. There would be nothing in that to surprise or dismay me. To speak frankly, indeed, I have never been able to agree with Mr. Russell's metaphysical assumptions (for metaphysical they are, even if they are also "scientific"), or to accept his own estimate of the value of the method of analysis he employs. Much that to him is plain fact and matter of empirical observation I am forced to regard as fiction and mythology: and in many of the results of his analysis I can see only the products of indefensible abstraction, of loose thinking and uncritical acceptance of the catchwords of popular Psychology. In thus describing my own attitude to Mr. Russell's position and method, I am merely stating what both of us (as I believe) have long recognised, and what for my own part I profoundly regret. But my bewilderment on the present occasion is not entirely, nor even mainly, due to this fundamental difference between our philosophical positions—or, if Mr. Russell prefers the term, between his "Science" and my "Philosophy". What most dismays me is that, *if I accept the framework within which his account is developed and consider his actual statements*, I find him asserting what nobody, least of all a man of his "habit in the use of words," can possibly *think*.

1.

Let us examine first what Mr. Russell says about "visual images" and their "meaning". "The chair opposite to you is empty; you shut your eyes and visualise your friend as sitting in it."[2] Or again "You are in a familiar room at night, and suddenly the light goes out. You will be able to find your way to the door . . . by means of the picture of the room which you have in your mind."[3]

Now, up to a certain point, there is no dispute about the facts. I can "imagine" or "visualise" an absent friend: I can "picture" the room in the dark, or (for that matter) in the light with my eyes shut. Nor is there any harm in the loose metaphors of ordinary speech, unless we take them

[1] "On Propositions: What they are and how they mean" (Aristotelian Society, Supplementary Volume II.: *Problems of Science and Philosophy*, pp. 1-43). [2] *Article*, p. 11.

[3] *Reply*. We must remember throughout that "in my mind" means, on Mr. Russell's view, "inside my skin".

at their face-value. Thus, when I "visualise" the room, it is natural enough to say that I "have a picture of it in my mind". And when I "imagine" an absent person, I may, like Mr. Russell's "ordinary uneducated" friend,[1] suppose myself to be "calling up a visual picture". Nobody, I should have thought, would take these picturesque periphrases as exact and literal descriptions of fact, unless he was very uneducated or thoroughly corrupted by bad Psychology. Nobody, I should have thought, would analyse "visualising" or "imagining" into "calling up," and into the "visual picture" or "image" which is summoned, and regard either or both of these *abstracta* as isolable constituents, as actual constituent parts, of the "visualising". And nobody, I should have thought, would seriously contend that, when I "visualise," there is in fact occurring "in my mind" or "inside my skin" a "visual picture"—a constituent part of my "visualising," a something which, in "visualising," I do in fact "call up" and see. One might as well contend that, when I look at a tree, there is, as a constituent part of my "seeing," a "visual sensation" occurring in my mind or inside my skin: or indeed that, what I really "see," are the twin inverted images, which you may detect on my pupils or which the physiologist may imagine to be imprinted on my retinæ.

Yet, if I am not mistaken, Mr. Russell's analysis of "visualising" does in fact isolate the "visual picture" from the "calling up," and convert the popular periphrasis into a literal description. Under his treatment, the "visual picture" becomes an independent event or "imaginal phenomenon,"[2] isolated from the visualising, though still *called* "visual" and a "picture". And, as thus isolated, it is supposed to be one of those "observable entities," of which (as he declares) "meaning is an observable property".[3]

[1] *Article*, p. 11. Owing no doubt to her defective education, Mr. Russell's friend seems to have assumed that the two alternatives he put before her were exhaustive: *i.e.*, that, unless she could "call up a visual picture," she must be unable to "visualise" altogether and could "only use words describing what such an occurrence would be like".

[2] *Reply*.

[3] *Reply*. It is impossible to forget (*a*) that the word "entity" would "have to be devoid . . . of meaning," were it not that it has "verbal associations, the learning of which constitutes the study of Metaphysics" (*Reply*), and (*b*) that meaning is a "relation," that a relation "constitutes" meaning and that a word not only "has" a meaning, but is related "to its meaning" (*Article*, p. 19: *cf.* p. 7). And remembering these statements, I feel certain difficulties which I cannot persuade myself to dismiss as merely verbal. Can an "entity" (with its sheerly metaphysical affinities) be "observed"? Is a "relation" always—or ever—an "observable property"? And is a word, in so far as it has a meaning, related to a relation?

To begin with, then, the "visual picture" is an event in me, not in the outer world.[1] As occurring "inside my skin," it is an "introspective datum," observable only by myself. Since, however, "it *may* be a *physiological* event,"[2] I suppose that one day we may hope—by skilful vivisection and preparation, and by using the appropriate chemical reagents—to observe the images as they occur inside another person's skin.

Next, we must notice that the image may be, or become, a constituent of that "fact" or "complex" which Mr. Russell calls an "image-proposition".[3] And since an image-proposition is as "solid" and "actual" a fact as anything in the Universe—since it is in no sense "imagined" or "ideal" in contrast to what is "actual" or "real"[4]—the images, which are its constituents, are clearly not "imagined" or "ideal" either.

Nevertheless—and here the doctrine becomes very hard to follow—images are "purely mental,"[5] "non-physical data," "not amenable to the laws of physics," and "radically distinct from sensations".[6] I take these statements on trust (for I cannot myself observe these "entities"), though the reasons Mr. Russell gives do not seem very convincing. He says (*a*) that visual images, "if taken as sensations, contradict the laws of physics".[7] But *must* I take my "visual image" as a visual sensation?[8] Unless I commit this blunder, how does my "visual image" contradict the laws of physics? Is

[1] *Article*, p. 11. [2] *Ibid.*, p. 11.

[3] *Ibid.*, *e.g.*, pp. 26, 29.

[4] *Ibid.*, p. 37. I shall return to image-propositions below.

[5] *Ibid.*, p. 27. I cannot pretend to conjecture what Mr. Russell means by "mental".

[6] *Ibid.*, p. 14. In view of Mr. Russell's argument (against the "behaviourist" theory of language) that these "non-physical data" are indispensable to thinking, it is puzzling to find him still hoping that thought "may be explained some day in terms of physics" (*Reply*).

[7] *Article*, p. 14.

[8] Mr. Russell (*Article*, p. 14) says that to "locate" the image of my absent friend "as a physical phenomenon" in the empty chair, would contradict the laws of physics: and to locate it in my own body, would conflict with its character as "visual". But he has already "located" the image in my body: for it is an event occurring inside my skin. Nor, on his theory, does this "location" conflict with its "visual" character: the conflict only arises if I suppose the image to be (not a "visual," but) a "visible" event in my body. He does in fact suppose that: for he confuses the bodily or nervous change (with which my "visualising" is connected, and on which it in part depends) with an isolable constituent of the "visualising"—with a "picture" which I call up and gaze upon. But, if we rid ourselves of the metaphorical jargon, is it not obvious that I may "visualise" my absent friend without believing him to be corporeally present in the chair or "inside my skin"—*i.e.*, that I may "visualise" without suffering either from hallucination or from insanity?

it, on Mr. Russell's theory, any more recalcitrant to those laws, than *e.g.* a tooth-ache or a stomach-ache? These too occur "inside my skin"; and they differ, because thus confined, from a "sensation" of noise—*e.g.*, from a clap of thunder.[1] Yet—so we are assured—"it is not very difficult to find a place for tooth-ache in the physical world"[2]: and the stomach-ache "belongs" to my body,[3] which I presume is physical. Moreover, are not "images" amongst those "elements" to which "thought and will and purpose and the rest of the apparatus of our mental life are reducible"? Yet these "elements," we are expressly told, "concern my inside in just the same sense in which a stomach-ache does, and in no other".[4]

Nor (*b*) is Mr. Russell's other reason more convincing. A visual image, he says, "must be radically distinguished from a visual sensation, since it affords no part of the data upon which our knowledge of the physical world outside our own body is built".[5] But my "visual images"—if I could "observe" them—would afford data through which I might obtain knowledge of my own body[6]; and my own body is a part of "the physical world outside" *your* body. Why, then, should not *your* knowledge of the physical world be derived in part from what I discover (and tell you) about my "visual images"?

Disregarding these and other difficulties, let us accept Mr. Russell's account as an accurate description of his own "visual pictures"—those which he has himself "observed". Each of these images (to summarise its leading characteristics) is an event occurring inside his skin; real and solid and actual, not imagined or ideal; purely mental, non-physical, not amenable to the laws of physics. What is the "meaning" which may be observed as a property of these "observable entities"?

(*a*) According to the *Article*, a visual image "resembles" or "copies" sensations. And when, *e.g.*, our image of a familiar room resembles "what the room was when we previously saw it," "we may say that our image 'means'

[1] *Article*, p. 13. We must bear in mind, even though Mr. Russell sometimes forgets, that (*cf.* p. 26) a sensation "is simultaneously part of the mind of the person who 'has' the sensation, and part of the body which is 'perceived' by means of the sensation".

[2] *Ibid.*, p. 12.

[3] *Ibid.*, p. 13. [4] *Reply*. [5] *Article*, p. 11.

[6] *Cf.* Mr. Russell's remarks on the scientific value of the knowledge of my own body which I obtain through my essentially "private" bodily sensations (*Article*, p. 12).

the room".[1] We *may* say so: but do we in fact? If Mr. Russell is accustomed to say of a photograph that it "means" its original, or of a forged bank-note that it "means" what it copies, there is no law to prevent him from indulging in so harmless an eccentricity. But most of us reserve "means" for "signs" or "symbols" with little or no resemblance to what they symbolise. A violet "means" humility, and a fox "means" cunning. But the forgery is a "close imitation" of the genuine note, and the photograph "*is* Jones" or "is exactly like him".

(*b*) Another (and, as I think, incompatible) theory is put forward in the *Reply*. My "visual image," which I "have in my mind" when the light goes out, is supposed to be "associated" with my past "visual sensations" of the illuminated room. If, and when, my "visual image" causes[2] actions "appropriate" to these associated sensations (if, *e.g.*, it enables me to reach the door), then, and therefore, it "means" them. In other words, the image need not "resemble" the sensations in order to "mean" them. It "means" them if, and because, it produces the effects which ("from the point of view of" my "instincts and desires") are "appropriate" to them. Suppose, then, I call up a "visual picture" of an absent enemy. *According to the Article*, this "visual image" will "mean" my enemy if, and because, it "copies" him—*i.e.*, resembles what he was when I previously saw him. But, *according to the Reply*, the image will "mean" my enemy only if, and because, having been "associated" with visual sensations of him, it throws me into a fury, or leads me to run away, or causes whatever actions may, from the point of view of my instincts and desires, be "appropriate" to the visual sensations which were (let us not forget) "simultaneously" parts of my mind and parts of his body.

Would a "visual image" have *no* meaning the first time it occurred? And would it be equally devoid of meaning, even after it had become "associated" with past sensations, if it failed to cause actions "appropriate" to the latter—or if it caused no actions at all? Or are we to assume that no "visual image" ever occurs for the first time (or without an established "association"), and that every image *must* cause actions "appropriate" to "associated" sensations? I cannot conjecture how Mr. Russell would answer such questions:

[1] *Article*, pp. 22-23. I think the whole "copy" theory wrong, but I cannot discuss the matter here.

[2] By what Mr. Russell calls "mnemic causation"—a name which serves like putty to conceal the chinks in his theory.

still less, how he would defend his conceptions of "Association" and "Causation" against the criticisms of writers like T. H. Green and F. H. Bradley. The criticisms, it is true, were published long ago: but the fact that they are familiar and even classical, and that nobody has ever succeeded in answering them, does not in the least diminish their force.

2.

Having analysed "visualising" into a "visual image" (which occurs as an "observable entity" in the mind or inside the skin) and a "having" or "calling up," Mr. Russell applies a similar analysis to Belief. Belief (so I understand) "consists of" or "contains" the following isolable constituents: (*a*) a proposition which is believed,[1] (*b*) a feeling which is believing,[2] (*c*) a relation between the proposition and the feeling,[3] and (*d*) a relation between the proposition and its "objective," *i.e.*, "the fact which makes it true or false".[4]

Much as I should like to test Mr. Russell's amazing claim that his theory of belief "accords with what can be empirically observed . . . and rejects everything mythological or merely schematic,"[5] the utmost I can attempt in the space at my disposal is to examine some of his statements about propositions and their meaning.

A proposition is "*what we believe when we believe truly or falsely*".[6] It "is, whenever it occurs, an actual fact,"[7] as

[1] The belief expressed in words normally contains two propositions, *i.e.*, an image-proposition as well as a word-proposition: *cf. Article*, pp. 28-29. The possibility (which Mr. Russell neither asserts nor denies) that "a single simple image may be believed" (p. 28), may be disregarded for my present purpose.

[2] Mr. Russell thinks there are "various different feelings collected together under the one word 'belief'". The collection includes "memory, expectation, and bare non-temporal assent"—and *possibly* other "feelings" (*Article*, p. 32).

[3] The statement that "in any case belief is something which has to be added to an image-proposition" (*Article*, p. 41) suggests that this relation is one of addition. But since "added to" implies an "act," and the theory claims to have dispensed with everything so "schematic" as an "act" or a "subject" (*cf.* pp. 25-26, 27-28), "added to" is perhaps only a picturesque equivalent for "co-exists with".

[4] *Cf. Article*, pp. 24, 29, etc. [5] *Ibid.*, pp. 27-28.

[6] *Ibid.*, p. 1. I disregard the alternative description of the proposition as "*the content of a belief*, except when, if ever, the content is simple" (p. 28: *cf. e.g.*, p. 24). "Content" is a slippery word—at least as slippery as "experienced," which Mr. Russell condemns as "calculated to create a smoke-screen about any position". (*Reply.*) Belief "contains" two relations and a feeling as well as a proposition: and no reason whatever is given for confining the term "content" to the proposition, or for assuming that belief "contains" it in any distinctive sense.

[7] *Article*, p. 30.

"solid" and "actual" as the fact which makes it true or false.[1] And, being a fact, it is "complex"; *i.e.*, it "has," "contains," "consists of," or "is composed of," constituents. Whether its constituents are always themselves complex, is uncertain: for Mr. Russell is careful neither to assert nor to deny that "the world contains" simples as well as facts.[2]

There are two kinds of propositions: those which consist of words and those which consist of images.[3]. Let us follow Mr. Russell's example and "begin with the most tangible thing: the proposition as a form of words".[4]

(i) A word-proposition, we are told, "is a complex symbol"; and its meaning "depends upon the meanings of the separate words"—the relatively simple symbols of which it consists.[5] Now, Mr. Russell argues—and I will assume he is right, though I am far from thinking so—that, whereas "words used demonstratively describe and are intended to cause sensations, the same words used in narrative describe and are intended to cause images".[6] In the narrative use of language, the single words describe a "memory-image" in the speaker or writer, and "create" or call up an "imagination-image" in the hearer or reader: and it is in this actual, or possible, result of their use, that their "meaning" essentially lies.[7]

Suppose, therefore, in narrating to you the events of Roman History, I say "Antony," I am describing a "memory-image" in myself, and "creating" (or trying to "create") an "imagination-image" in you, the hearer. The images in question, as we already know, are "copies" more or less resembling "sensations"—my own and also yours. The same holds, if I go on to say "loved": except that, as we shall see, "loved" describes and creates not an *image* of a relation between sensations, but the identical relation that related (or relates) the sensations themselves.[8] And if I complete the sentence by adding the word "Cleopatra," I am again

[1] *Article*, p. 37.

[2] *Ibid.*, *e.g.*, pp. 1, 2, 28, 29, etc. I suppose Mr. Russell would say that "the simple sensible qualities that enter into an image" (p. 23) are postulated only subject to the acceptance of "Hume's principle". Yet, if "Hume's principle" be rejected, what remains of the theory that images "copy" sensations?

[3] *Ibid.*, p. 29. [4] *Ibid.*, p. 7.

[5] *Ibid.* Mr. Russell recognises (though, as I think, inadequately) that the meaning of the single words depends in turn to some extent upon the meaning of the proposition as a whole: *cf.* p. 27.

[6] *Ibid.*, p. 22. [7] *Ibid.*, pp. 21-22.

[8] *Cf.* below. We must add (a reservation which does not affect the main point) that the past tense in "loved" does not belong to *what is believed*, but to the "feeling" which is the "believing" (*cf. Article*, pp. 29-30).

describing a "memory-image" of my own and "creating" (or trying to create) an "imagination-image" in you. Thus, since the single words "mean" the images they describe and are intended to cause, we reach Mr. Russell's conclusion that "as a general rule, a word-proposition 'means' an image-proposition".[1] And when he says "Antony loved Cleopatra," he means—or at least the word-proposition means—that an Image loved an Image. It describes the unholy passion of one event inside his skin for another, and creates (or is intended to create) a corresponding disturbance inside the hearer's skin. It "means" that two "purely mental" entities were—or are—consumed with lust for one another.

Mr. Russell may say what he likes: but, with the utmost respect, I must refuse to believe that he *thinks*, or *can think*, his assertion that "Antony loved Cleopatra" means anything of the kind.

(ii) The images, of which an image-proposition consists, "mean" (as we saw) the sensations which they severally "copy" or resemble.[2] But the image-proposition as a whole does not "mean" anything. In its case, "'referring to' takes the place of 'meaning'"[3]: it "has an objective reference dependent upon the meanings of its constituent images".[4]

Mr. Russell is determined to maintain that "truth consists in correspondence".[5] And, in this desperate endeavour, he formerly advocated a theory that belief consists "in a multiple relation of the subject to the objects constituting the 'objective'". This theory, as he now appears to recognise, made it difficult—many of us would say "impossible"—to understand what it is we believe when we believe falsely.[6] Moved perhaps to some slight extent by the recognition of this "difficulty," but chiefly (it would seem) by the desire of eliminating so "schematic" an element as the "subject," he has advanced—if it is an advance—to his present position. *What we believe* (he now suggests) is a proposition[7] intervening between our believing and "the fact which makes our belief true or false," *i.e.*, the "objective" of the proposition. Truth and falsity consist respectively in the corre-

[1] *Article*, p. 29: *cf.* p. 30.

[2] Disregarding the theory put forward in the *Reply*, and speaking roughly.

[3] *Article*, pp. 36-37.

[4] *Ibid.*, p. 30.

[5] *Ibid.*, p. 36.

[6] *Ibid.*, p. 27.

[7] Word-propositions, as well as image-propositions, "refer to" objectives (*Article*, pp. 36-37): but normally (as I understand Mr. Russell) word-propositions "refer to" objectives only through the image-propositions which they "mean" (*cf.* pp. 28-29).

spondence or failure of correspondence between the proposition and its "objective". A true and a false proposition (*e.g.*, The window is to the left of the fire, The window is to the right of the fire) both "refer to" the same "objective," which neither of them "means": or the same proposition is true or false according as it "refers to" different "objectives" neither (or none) of which it "means".[1] What we believe, when we believe falsely, is a false proposition—*i.e.*, a proposition "referring to" an "objective" with which it does not correspond.

Let us see, taking Mr. Russell's own example, exactly what is involved in "the simplest possible schema of correspondence" between an image-proposition and its objective.[2] In the room I saw last week the window was to the left of the fire. I now "call up a picture" of the room and "give to this picture that sort of belief which we call 'memory'". *What I believe* is an image-proposition, a "complex image," which Mr. Russell analyses (for the present purpose) into an image of the window, an image of the fire, and a spatial relation between them. The "objective"—the fact which makes the image-proposition true or false—is (or *was* last week) one group or complex of sensations ("the window") actually existing to the left of another group ("the fire"). The two images in the image-proposition severally "copy" or "resemble" (and therefore "mean") the "window" and the "fire".

Suppose *first* that the image-proposition is *false*. In that case, the relation, which couples the images, does not (or did not) "hold" between the elements of the "objective". There is no fact, no complex consisting of sensations and a relation between them, "corresponding to" this false image-proposition. There never was any such counterpart fact, though there were actual sensations of which my present images singly are "copies". *What I believe*, when I believe falsely, is an image-proposition which, as a whole (as a proposition), neither has, nor had, a counterpart complex or fact. And why this proposition should be supposed to "refer to" any one "objective" rather than another—or indeed to any "objective" at all—I cannot understand. Mr. Russell, I presume, would "explain" this difficulty (if he admitted there was a difficulty) by an appeal to the special quality of that feeling in his "collection" which we call "memory".

Suppose *next* that the image-proposition is *true*. In that case, according to Mr. Russell, the images are coupled by

[1] *Article*, pp. 36-38. [2] *Ibid.*, pp. 37-38: *cf.* also p. 30.

"the same relation"—by "the very same relation"[1]—as that which couples (or coupled) the elements of the "objective". Now, those elements are sensations. And sensations are *simultaneously* parts of the mind of the person who "has" them, and parts of the body which is "perceived" by means of them.[2] In our example, the sensations in question were "parts of my mind" last week: and to-day they, as *sensations*, no longer exist, for I am not now *seeing* the window or the fire, but only imagining them. The sensations, therefore, vanished a week ago. Nevertheless, we are asked to believe that "the very same relation," which coupled these vanished sensations, is *now* coupling the constituent images of my image-proposition. Has this relation survived, bare of all terms, for a week? Or did it vanish with its terms—the past sensations—a week ago: and has it now emerged, by some miraculous resurrection, to couple two "purely mental" events inside my skin?

Clearly, on any interpretation, this relation is a very remarkable "entity" indeed. And perhaps the most remarkable thing about it is that it is postulated by a theory which claims to reject "everything mythological".[3]

[1] *Article*, p. 38. [2] *Ibid.*, p. 26. [3] *Article*, p. 28.

II.—THE PHILOSOPHICAL ASPECT OF THE THEORY OF RELATIVITY.[1]

A Symposium by A. S. Eddington, W. D. Ross, C. D. Broad, and F. A. Lindemann.

I. By A. S. Eddington.

It is natural for a scientific man to approach Einstein's theory of Relativity with some suspicion, looking on it as an incongruous mixture of speculative philosophy with legitimate physics. There is no doubt that it was largely suggested by philosophical considerations, and it leads to results hitherto regarded as lying in the domain of philosophy and metaphysics. But the theory is not, in its nature or in its standards, essentially different from other physical theories; it deals with experimental results and theoretical deductions which naturally arise from them. The only point in which it shocks our conservatism is that it regards the investigation of the properties of physical time and space as being a legitimate subject of experimental and theoretical research, like the investigation of the properties of matter. Time and space are things which a physicist is continually using and measuring; and it is difficult to see why he should not be allowed to investigate their properties without being condemned as a metaphysicist. I think the opposition arises from the impression that in their physical aspects the properties of time and space are so simple and so inevitable that we have long known all that there is to be learnt by physical methods; and therefore if an investigator spends any time over these he must necessarily be trespassing beyond legitimate physics. On the other hand, we know that much remains to be found out as to the physical constitution of matter; and so the man who occupies himself with it is not presumed to be speculating metaphysically as to the meaning of substance. But the relativity theory makes it clear that the experimental study of the physical aspects of space and time has not been

[1] Contributed to the International Congress of Philosophy, 1920.

exhausted; it applies the recognised scientific method to this study; and there is no breach of continuity with ordinary physics. It unfolds a physical theory of space and time and matter, which, we can scarcely doubt, marks a great advance. It would be rash to suppose that it reaches finality; but it bears all the indications of being one of the more permanent stages in the advance towards Truth.

I would emphasise then that the theory of relativity of time and space is essentially a physical theory, like the atomic theory of matter or the electromagnetic theory of light; and it does not overstep the natural domain of physics. But, speaking to an audience of philosophers, I shall not hesitate to trespass beyond the borderline on my own account. I shall be a stranger in a strange country; and the lurking pits might well intimidate me, if I did not rely on your friendly hands to pick me out.

We can perhaps obtain some insight into the meaning of Relativity by analysing the idea of "green". Green light is primarily a sensation experienced by a normal individual, which is obviously subjective. In current physics it is supposed that there is in the external world an exact objective counterpart to green light, *viz.*, electromagnetic oscillations of a particular quantitative character; and, so far as physics is concerned, the name "green light" is transferred to this objective counterpart. Further this quantitative character can be consistently estimated by physical appliances other than the eye, so that even in its subjective aspect it is no longer necessary to insist on the psychological significance of green. We ought now to be able to dispense with the idea of any recipient of the light, so that there are electromagnetic waves in Nature which can be described as absolutely green. But that is too hasty a conclusion. If we take an observer travelling rapidly to meet these waves, they will appear to him not green but blue; if this is an illusion, it is shared by his spectroscope, his photo-electric cell, the chlorophyl of the plants, by everything travelling with him. For a whole moving world the light is blue; for a differently moving planet it will be orange; what meaning then can we attach to its absolute greenness? Why have we singled out green as the true colour, when to the different conceivable worlds it takes all hues of the rainbow? We are forced to admit that we called it green merely because it was green for some particular observer whom we had in mind at the start. Now here modern experimental investigation comes in; we have entirely failed to discover anything pre-eminent about this particular observer, or any other observer, entitling his views to more

weight than those of observers with different motions. If we lost him, there is no criterion whatever by which we could reconstruct him. It is the old philosophical point (perhaps unexpectedly applicable) that absolute motion is meaningless and undetectable, and therefore observers merely differing in their motions present no criterion for singling out a leader. We cannot call the light absolutely green, when it is only green for a particular observer arbitrarily selected. This drives us back practically to the starting point; green is not an objective quality of the light. Even when we have abstracted the psychological significance of colour, it still remains a relation on which the objective reality and some specified recipient are both involved. It is commonly said that a sodium atom always radiates yellow light; but the light is only yellow relative to the atom itself, or to an observer having the same motion. Intrinsically the light has no particular colour, and observers can be imagined for whom it is violet or red. The relativity theory does not arbitrarily divide this colour into objective yellowness plus a correction for the motion of the recipient; it simply accepts the plain fact that the colour-name applies to a relation of the reality to a recipient.

At first sight this seems to throw over the common view that colour is determined by the length of the electromagnetic waves. Is not the true and absolute colour-quality that which corresponds to the length of the waves; whereas the colour actually perceived may be modified by the observer's motion according to well-known principles? This brings us to the most revolutionary idea in the relativity theory. Length itself is not an absolute character intrinsic in the external world; like colour, it is a relation between the thing in Nature and the observer, being modified by his motion. This has escaped common notice, because all observers who can compare notes share practically the same motion—that of the earth. It is only recent delicate experiments that have revealed it. If length cannot be relied on as absolute, what shall we say of the other quantities of physics? The answer comes that all the more familiar terms of physics—duration of time, mass, force, energy, etc.—denote not objective characters, but relations to some observer or his idealised equivalent; and, in particular, these relations are modified by his motion.

We thus see that the knowledge contained in current physics is only a knowledge of the relations of Nature to particularly circumstanced observers. It is not on that account to be condemned; we shall continue to study and ex-

tend this relative knowledge. But it is important in many cases in physics, and still more in philosophy, to appreciate its relativity. We must make a special study of the way in which the relation changes for differently circumstanced observers, and abandon the crude methods which arose under the mistaken impression that under the familiar names we were dealing with things objective and independent of us. When this is done many of the perplexities of modern science are cleared up, and a great simplification results.

Since physics has not hitherto dealt with the absolute world, we may ask whether it is competent to do so. It is. The problem is not so very difficult to solve; it was not solved before because until recently we were unaware that there remained such a problem to solve. To put the claim rather more modestly and more accurately, we can arrive at a description of the physical phenomena which is independent of the motion of the observer (that being apparently the confusing factor in our present relative knowledge). In a sense the expression of this knowledge is still relative, because our imaginations can only work with material which is in some degree familiar; but the recipient, whom we set up to relate external Nature to, is now only a dummy whom we can change freely without altering anything in the description. It is not like the older relative knowledge in which *green* has to become *red* when we change the observer.

The absolute world of physics thus reached is four-dimensional, events outside us being arranged in an indissoluble four-fold order which may be regarded as a combination of space and time. Space and time are relations to an individual, and as relations are quite separate. But there is not one objective reality at the far end of the space-relation, and another reality at the far end of the time-relation; both relations spring from one common source. Perhaps I may venture to indicate how the common distinction of space and time arises. The observer himself is part of the world, and from a four-dimensional point of view we must regard him as having the form of a *worm*. He distinguishes the order of events in the direction of his length as time, and his other three dimensions he regards as space. He applies this to his own elongated form, and considers that he himself has considerable duration in time, but more modest extension in space. We easily see that worms whose lengths lie in different directions (or, as we should ordinarily say, individuals who are moving with different velocities) make a different dissection into time and space. But this is not all; the objective four-dimensional continuum is indissoluble; but if we take in it two arbitrary

events A and B, the relation between them (out of which their physical aspects arise) is one or other of two qualitatively distinct kinds. On developing the theory, it is found that if the relation of A to B is of the first kind it is possible for a particle of matter to extend from A to B, but not if it is of the second kind. That is a property inherent in the constitution of matter. In physics we deal only with observers who possess material bodies, however abstract they may be in other respects; and consequently the length of one of our worms cannot lie along AB unless the relation between the two points is of the first kind. (In ordinary language the observer must not travel faster than light.) It follows that although the worms can lie in all kinds of directions within wide limits, yet in every case the relations of events along the length of a worm, which he takes to be the time-order, are qualitatively and objectively of a different kind from the relations in transverse directions which he adopts as space. That is why time and space appear and are so different. The observer's velocity (or four-dimensional extension) determines his separation of time and space; but behind that there is a rudimentary objective differentiation of orderly relation, which limits the observer's velocity and is by that means carried through into the resulting separation.

We believe that this theory (or rather the analysis which is equivalent to it) greatly elucidates the meaning of our measurements of space and time, and has far reaching consequences in physics. I doubt whether its importance in philosophy is so immediate as is often supposed, because it leaves us still with an objective distinction between time-like and space-like order. The mathematician differentiates these by the aid of his symbol $\sqrt{-1}$; but that, of course, does not throw light on their intrinsic unlikeness.

Minkowski summed up the earlier relativity theory in the celebrated phrase, "Time and Space in themselves sink to mere shadows". Moritz Schlick, in his admirable book,[1] has said that this must now be extended to—Time and Space and *Things* sink to shadows. "The combination or oneness of space, time and things is alone reality; each by itself is an abstraction." With *things* I take it that he includes not only matter but all that is commonly supposed to be *in* space and time, for example, fields of force. It is so easy to give glib acceptance to this doctrine, so difficult to rise to it in our outlook on physics. The non-Euclidean heterogeneous space of Einstein is a natural consequence of this view; for "things"

[1] *Space and Time in Contemporary Physics.*

are everywhere heterogeneous, and it is unlikely that the same oneness can manifest itself as homogeneity in its space-aspects and heterogeneity in its thing-aspects.

I have tried to show elsewhere[1] the exact method by which, starting from a relation undefinable in its absolute character, we arrive from a single source at the physical quantities which describe space and time on the one hand and the quantities which describe things on the other hand. If we describe the character (or geometry) of space and time throughout the world, we at the same time necessarily describe all the things in the world. The conspicuous instance of this is in Einstein's theory of gravitation, where in describing the geometry of space and time throughout the solar system, he finds himself describing at the same time the sun's gravitational field. The same applies also to other things such as matter. The difference between space occupied by matter and space which is empty is simply a difference in its geometry. There seems to be no reason to postulate that there is an entity of foreign nature present which causes the difference of geometry; and if we did postulate such an entity it would scarcely be proper to regard it as physical matter, because it is not the foreign entity but the difference of geometry which is the subject of physical experiment.

In contemplating the starry heavens, the eye can trace patterns of various kinds—triangles, chains of stars, and more fantastic figures. In a sense these patterns exist in the sky; but their recognition is subjective. So out of the primitive events which make up the external world, an infinite variety of "patterns" can be formed. There is one type of pattern which for some reason the mind loves to trace wherever it can; where it can trace it, the mind says, "Here is substance"; where it cannot, it says "How uninteresting! There is nothing in my line here". The mind is dealing with a real objective substratum; but the distinction of substance and emptiness is the mind's own contribution, depending on the kind of pattern it is interested in recognising. It seems probable that the reason for selecting the particular type of pattern is that this pattern has (from its own geometrical character, and independently of the material in which it is traced) a property known as *Conservation*. Reverting from the four-dimensional world to ordinary space and time, this property appears as *permanence*. That the mind would necessarily choose for the substance of its world something

[1] MIND, Vol. XXIX., No. 114.

which is permanent seems natural and inevitable. The interesting point is that there is no obligation on Nature to provide explicitly anything permanent; the permanence is introduced by the geometrical quality of the configuration, which the mind looks out for in whatever Nature provides.

Now it appears that a great number of the well-known laws of physics, mechanics and geometry are implicitly contained in this identification of substance. That is to say, these laws do not govern the course of events in the objective world, but are automatically imposed by the mind in selecting what it considers to be substance. They are identities contained in the definition of the geometrical character of the pattern which the mind hunts out. If all the discoveries of physics related to laws of this kind, we should be forced to admit that physics has nothing to contribute to the great question of how the world outside us is governed. I am not as yet prepared to admit that. I think that we do, more especially in modern physics, encounter the genuine laws governing the external world, and are attempting—perhaps rather unsuccessfully—to grapple with them. But the great exact laws of gravitation, mechanics and electromagnetism, by which physics has won its high reputation as an exact science, all appear to belong to the other category; and, when these are set aside as irrelevant, our claim to have grasped the type of law, or even the meaning of law, prevailing in the world outside us is reduced to very modest proportions.

An aged college-bursar once dwelt secluded in his rooms devoting himself entirely to accounts. He had cut himself off entirely from the life around him, and he realised the intellectual and other activities of the college only as they reflected themselves in the bills. The accounts were his world; and the different items took on an individuality in his mind. He vaguely pictured an objective reality at the back of it all —some sort of parallel to the real college—though he could only imagine it in terms of £. s. d., which constituted its relation to him. His method of account-keeping had become inevitable habit, handed on to him from a long succession of hermit-like bursars; and he had no idea that he was in any way concerned in the method; it seemed impossible that the accounts could be put in any other way. But he was of a scientific turn, and he wanted to know more about the college—the world of his accounts. One day, in looking over the books, he discovered a remarkable thing. For every item which appeared on the credit side of the account, an equal

item appeared somewhere else on the debit side. "Ha!" said the bursar, "I have discovered one of the great laws governing the college. It is a perfect exact law of nature with no exceptions. Credit must be called plus and debit minus; so we have the law of conservation of £. s. d. This is the mode of investigation which alone can give me sure knowledge of the world, and I see no limits to the field it will ultimately cover. I have only to go on in this way, and I shall begin to understand why it is that prices are always going up."

Perhaps it is conservatism, but I am not prepared to press this analogy quite to its apparent conclusion. I do think that we have, like the bursar, tended to confuse the laws of economics with the laws of accounts—the laws under which the objective world is developing itself, and the laws inherent in the overlapping of the different aspects under which we relate it to ourselves. I think that the results in which physics has been so conspicuously successful are mainly of the latter character. But I think that the bursar's method of investigation was a sound one; I would not have him give up his books, and turn in despair to the faint confused sounds of an outside activity which from time to time penetrate the walls of his cell. *Ne sutor ultra crepidam.* The laws of economics are not going to be reached so easily as he supposed; they are not even on the same plane as his first sensational discovery belonged to; but by diligent study of his world of accounts he may yet be able to puzzle out something of the activity behind.

And so, when the seed reproduces the character of its parent, when the tree clothes itself in leaves, when philosophers are drawn together in congress, it may be misleading to compare the motive-laws with the familiar type illustrated by the law of gravitation. The line of demarcation is not between vital and inert phenomena. The point is that the idea of law even in the world of inert matter may, in some way as yet undefined, transcend the instances which are as yet known; that these instances are, indeed, not fair parallels for comparison. The old type of law must, of course, always be obeyed—the college may totter, but the bursar's accounts still balance. If this is indeed so, it will not be easy for the physicist, who, however, has already a strong suspicion that in the quantum phenomena, which he is now encountering everywhere, he is up against laws of a different type from those which have hitherto succumbed to his inquiries. But in the wider outlook on life this emancipation, if it prove true, is likely to be hailed with relief.

II. By W. D. Ross.

I do not propose in my contribution to the Symposium to discuss Prof. Eddington's paper, interesting as it is. His paper gives us not the line of argument which leads up to the theory of relativity, but rather the further speculations of one who has already been convinced by that line of argument. My difficulties begin further back, with the argument itself, and it is to some aspects of it that I will address myself. I should like, however, to comment on two remarks of his. 'There is no doubt,' he says, that Einstein's theory 'was largely suggested by philosophical considerations,' and a little later, 'It is the old philosophical point . . . that absolute motion is meaningless and undetectable.' It seems to be supposed by many of the scientists who have discussed the subject that philosophy condemns absolute motion, apart from any of the experimental grounds on which they themselves reject it; and they feel themselves fortified by this support from an independent source. Many philosophers have no doubt rejected absolute motion, but many others believe in it. For my own part, I think that Mr. Russell's chapter on the subject [1] is a complete refutation of at any rate the main philosophical arguments that have been urged against absolute motion.

I would make one other preliminary remark, with reference to Prof. Eddington's first page. The division of opinion about Einstein's theory is not in any sense one in which science and philosophy are ranged on opposite sides. Both scientists and philosophers are divided on the question; and the truth, on whichever side it lies, is to be reached by close thinking on certain questions, in one sense very simple, in another extremely difficult, competence to discuss which is not the monopoly of either scientists or philosophers, but whose solution is not so easy that either class of thinkers can afford to reject the aid of the other.

One of the difficulties about relativity is that its supporters seem in the very act of arguing for it to be implying its opposite. I will confine myself to the 'special theory'; until one can be satisfied about the truth of this, it would be useless to discuss the general theory which is an extension and in some degree a correction of it. Incidentally, one's faith in the argument should surely be somewhat shaken by the fact that the constant relative velocity of light, which is asserted in the special theory, is denied in the general. Were

[1] In *Principles of Mathematics*.

it a question of getting nearer to the truth by further experiment, there would be nothing surprising in this; but it is not satisfactory that 'the keystone of the old theory'[1] should later be so cheerfully dispensed with.

It seems to be generally agreed among relativists that the theory is forced on us in the first instance by the result of Michelson-Morley's experiment. We naturally assume light to have a constant absolute velocity in all directions; we therefore expect its velocity relative to the earth to be affected by the motion of the earth; but we find that apparently it is not. Hence we seem to be driven to accept one or other of two surprising theories, that of Lorentz or that of Einstein. Now why should we not adopt the hypothesis that the earth is at rest relatively to the ether? If it is, we should expect rays of light moving in different directions above the earth's surface to move with constant velocity relative to a starting-point on the earth, and there would be nothing surprising in the result of the experiment. But, I shall be told, this is to go back to the Ptolemaic view, which has long since been exploded. This, however, is not *my* solution; I am simply asking why it should not be the solution for a disbeliever in absolute motion. According to him, it is just as true that the station moves past the train as that the train moves past the station. It is then, as true that the rest of the universe moves relatively to the earth as that the earth moves relatively to the rest of the universe. The Copernican view is no truer than the geocentric; in fact they are the same view. 'But neither Ptolemy nor Copernicus was really right,' relativists will say, 'neither the earth nor the remainder of the universe is at rest; both are in relative motion, which is the only motion there is, and it is the existence of this motion that makes the Michelson-Morley result surprising and Einstein's explanation of it necessary.' But it is *not* the motion of the earth relative to the stars that makes the result surprising; it is the presumed motion of the earth relative to the ether. Now, that no such motion can be detected is a fundamental principle of their theory. Why, then, assume, as they do in their whole consideration of the experiment, that such motion exists? On their principles, the relative motion of the earth and the stars only requires that *one of the two* should be in motion relatively to the ether. The assumption that it is the earth that is so shows that relativists are Copernicans, and therefore at bottom not relativists.

But, I may now be told, relativists do not believe in an

[1] *I.e.*, of the 'special theory'. Prof. Broad in *Hibbert Journal*, April, 1920, p. 426.

ether at all. They speak with a divided voice on the subject, but their general opinion seems to be against this unfortunate entity, whose alleged attributes have always somewhat scandalised philosophers. There is, then, only motion of ordinary bodies relatively to one another. But then there is nothing whatever in the Michelson-Morley result to surprise and to call for Einstein's theory. There is no reason why the motion of the earth relative to the heavenly bodies should affect the velocity of rays of light in a laboratory, which have nothing to do with the heavenly bodies but only with the earth. It is only the assumption that the earth is moving (*a*) absolutely, or (*b*) at least with regard to the ether, that makes the result surprising and calls for either the Lorentz or the Einstein explanation. Disbelievers in absolute motion and in the ether have no need of Einstein's theory, and believers in absolute motion cannot accept it because it denies absolute motion.

Take, again, another assumption which is made by relativists in discussing the Michelson-Morley result. Prof. Broad [1] states three assumptions, and says that 'the rejection of any of them will merely bring us into conflict with some other set of well-attested experimental facts'. It is on the basis of the acceptance of these assumptions that all solutions other than those of Lorentz and Einstein are ruled out. One of these assumptions is 'that the velocity of light in stagnant ether is the same in all directions'. This assumption is described as 'the only reasonable one to make on the subject,' and it is rightly pointed out that its rejection would land us in greater difficulties than its acceptance involves. This does not mean that the *relative* velocity of light is constant. For this is the conclusion which is supposed to be established by the experiment, and therefore must not be presupposed in considering what is to be deduced from the result of the experiment. As far as I can see (though I may very well be mistaken) it can only mean (1) that light moves in equal times over equal distances in space, irrespective of direction, or (2) that it moves with equal velocity relatively to bodies at rest (or in like motion) relatively to the source of light, but in different directions from it. On the first interpretation, absolute motion is already admitted in one of the assumptions on which the proof of relativity rests. This interpretation will of course be rejected, and we come to the second. Suppose then that one of the bodies which are at rest relatively to the source of light begins to move towards it. Then the velocity of light relatively to it will become greater than its velocity relatively to the bodies that are still at rest relatively to the source.

[1] Prof. Broad in *Hibbert Journal*, April, 1920, pp. 427, 428

For Einstein, though he rejects Newton's addition-formula for velocities, sets up another in its stead; when two velocities are added the result is something different from either, though not (as Newton said) the arithmetical sum of the two. Therefore the velocity of light relatively to two bodies, one moving towards the source of light, and the other at rest with respect to it, will be different. Thus the assumption on which the argument rests is inconsistent with the statement in the theory, that the velocity of light relatively to all bodies is unaffected by their motion.[1]

Let me take a further illustration of the inconsequence which seems to beset even the acutest thinkers when under the influence of the glamour of relativity. Einstein[2] makes the assumption that two points of a railway line have been struck by lightning, and asks whether the statement that the strokes were simultaneous has any meaning. The reader is supposed to reply that the meaning is clear, but that he would find it difficult to say whether the statement was true. Einstein is not satisfied with this answer. 'A concept does not exist for the physicist until the possibility of discovering in the concrete case whether the concept applies or not is given.' The question how you could possibly discover the applicability or non-applicability of a concept that does not exist for you either does not occur to Einstein, or is deemed unworthy of notice; and it is inferred that in order to have a conception of simultaneity at all we need such a definition of it that we can determine whether the lightning strokes were simultaneous. The definition proposed is that the strokes are simultaneous if they are perceived simultaneously by an observer placed midway and furnished with an apparatus (*e.g.*, two mirrors placed at right angles) which allows a simultaneous optical fixation of the points A and B which were struck. The definition is obviously circular, and it becomes clear that what Einstein is looking for is not a definition but a test, and a test not of simultaneity, but of the simultaneity of two events not directly observed; for the test evidently rests on the observer's immediate judgment of the simultaneity of two events in his own consciousness. Thus it is clear that we have a conception of simultaneity before we set up the criterion which according to Einstein first gives us that conception. And, further, it is clear that we mean the same thing by 'simultaneous,' whether we are speaking of events in our

[1] This is what is *said*; what is *meant* can surely only be that observers' estimates of its velocity are unaffected by their motion. But to distinguish the fact from the estimates of it is to give up relativity.

[2] *Über die spezielle und die allgemeine Relativitätstheorie*, p. 14.

own consciousness or of events without it, though for the application of the word in the latter case we need a criterion which we did not need before applying it in the former.

Einstein supposes the above criterion to be met by the following criticism: 'I cannot tell whether light propagates itself with the same velocity from A to M and from B to M unless I already have at my disposal the means of measuring time; the reasoning therefore is circular'. His reply is: 'My definition makes no assumption about light. The definition of simultaneity has only to be such that in every real case it enables us to decide empirically whether the concept to be defined is applicable. That light takes the same time to travel both these journeys is not an assumption about the physical nature of light, but a statement I am free to make in order to reach a definition of simultaneity.' In other words, we have a word 'simultaneity,' but we attach initially no meaning to it; we get tired of making this meaningless noise, and decide to attach some meaning to it, and a meaning such that in terms of it we shall be able to say of any two events that they are or that they are not simultaneous. The important thing is to make some decision, not to make the right decision; as the word, so far, means nothing, there is no right or wrong about it. We assume that light takes the same time to travel equal distances, but this is not to make any statement about the physical nature of light, since 'same time' is equally meaningless with 'simultaneous'. It is of course obvious that so long as we do not want to make a right decision, but merely some decision, the assumption that light takes twice as long to travel a certain distance west as to travel an equal distance east, or the assumption that all telegraph boys move with equal speed, would do just as well.

It is surely clear that Einstein's supposed reader was right in saying that he does attach a definite meaning to 'simultaneous,' but does not always know whether two events are simultaneous; and it is clear that if he is to use light signals as a test of this he must know whether light does travel equal distances in equal times, as a matter of hard fact and not as a matter of mere arbitrary use of language. It is surprising that scientists should allow themselves to be fobbed off with the latter, which is all that on his own showing Einstein has to offer. However much he may deny it, the statement that light takes the same time to travel equal distances is a statement about the nature of light.

Take, again, the argument by which he proves the relativity of simultaneity (p. 16 ff.). He propounds the question

whether events simultaneous in reference to the railway line are simultaneous in reference to a train moving along it. An observer on the line at M midway between A and B will judge the strokes of lightning simultaneous if the rays sent out from A and B at the time of the strokes reach him simultaneously. But an observer at M′, the point on the train which was opposite M when the strokes (as judged from the line) occurred, will (if the train is moving towards B) be nearer to B than to A before either ray reaches him; the ray from B will therefore reach him before that from A, and he will judge the stroke at B to have happened before that at A. Thus two events which are simultaneous relatively to the line are not simultaneous relatively to the train. Hence simultaneity is relative, and any two things which are in relative motion have separate times of their own. On this argument three comments may be made.

(1) The relativity, if relativity there be, is relativity to minds, not to bodies. Leave out the judgments formed by the two observers, and the bottom drops out of the argument. This is obscured by Einstein when he describes each *body* of reference as having its separate time. The theory is at bottom a form of the old philosophical doctrine of the relativity of our judgments to, their dependence on, the peculiarities of our own minds. The novel element in Einstein's theory is that the peculiarity of each mind on which he makes its judgments depend is its situation at a body which is in motion relatively to other bodies. The relativity is a relativity to bodies only as actual or possible situations of minds, or of the sense-organs used by minds.

(2) Not only are the 'local times' really judgments about time depending on the motion of the observer, but the discrepancy between the two observers' judgments can be removed. The observers have only to allow for their relative motion; they will then make the same judgment. To this the relativist will reply, 'that may be so in the illustration; we have there supposed the train to be in motion, and to be known to be in motion, relatively to the line; but in actual fact we are not in that position. No experiment has ever revealed whether the earth is moving through the ether, and if so, how fast. Therefore we do not know what allowance should be made for such motion; the only reasonable thing is to ignore it, to treat it as making no difference to the velocity of light relatively to us; events which are simultaneous to one observer will then necessarily be non-simultaneous to another, and simultaneity will necessarily be relative.' I think we must agree that we do not know whether or how fast we are

moving, and therefore do not know what allowance to make for such movement. But surely the reasonable attiude is, not to say that we are theoretically right in making no allowance, that the conflicting judgments which will follow if we make no allowance are all of them right, and that therefore the same two events are and are not simultaneous. The reasonable thing is to say 'I do not know how much allowance should be made for my motion, but as my velocity is probably very small in comparison with that of light it will for most purposes make no difference. I will therefore ignore it. Anyhow I am just as likely to be right as if I made some arbitrary allowance.' Of conflicting judgments about simultaneity, then, certainly all but one, and perhaps all, will be wrong, but we cannot know, where the conflict depends on the unknown velocity of the earth, which, if any, is right. This seems to be the moral to be drawn, and though it is not the moral drawn by relativists, we owe it to them that it has been forced on our attention.

(3) It is surely clear that Einstein's argument to show that the two observers will make conflicting judgments rests on the assumption that the rays from A and B either start definitely at the same time or definitely at different times. In other words it is on the basis of an unacknowledged belief in absolute time that his argument here is worked out, and apart from that belief nothing whatever could be asserted about the times at which the messages will reach M and M'.

The conclusion to be drawn appears to be that the belief in absolute space, absolute time, and absolute motion is not a mere prejudice of common sense, but something that necessarily underlies all our thought, and that the argument which tries to disprove them is assuming them all the time. For the mathematical genius which has worked out the relativist view of the world we who are not mathematicians can have nothing but the profoundest admiration, but the superstructure is worthless unless the foundations are well and truly laid in general thinking about motion, distance, and simultaneity ; and there are some of us who have no conviction that this has been done. Until we can be led to see our error, we are bound to think that the explanation of the Michelson-Morley and similar results is to be found in some theory not about space and time but about matter or ether, some explanation like that of Lorentz, which seems to us, though surprising enough, to contain nothing that we need have any difficulty in believing. Since its transformation-equations are identical with those of Einstein, I take it that Lorentz's theory will do all the work that Einstein's special

theory will do. The latter theory seems to rest on a fundamental confusion between facts and the estimates which different observers will form of them.

III. By C. D. Broad.

I shall deal first with the difficulties found by Mr. Ross in arguments that have been used for the special theory of relativity. I think that these difficulties rest mainly on misunderstandings, and that they can easily be removed by a little explanation.

(i) Mr. Ross regards it as a weakness that the constancy of the velocity of light should be the keystone of the special theory and yet be discarded in the general theory. There is no real difficulty here, when we remember the different subjects with which the two theories are concerned. The special theory explicitly confined itself to systems in uniform translational motion with respect to a Newtonian frame of reference. It did not profess to tell us what would happen if a system rotated with respect to such a frame or moved with an accelerated rectilinear motion with respect to it. Now the general theory professes to deal with *all* motions, no matter to what they may be relative or what may be their kinematic characteristics. There is nothing startling in the fact that a proposition which is true and important for a restricted class of motions should not be true of all motions whatever. Mr. Ross would not, I trow, feel any difficulty if he were told that certain phonetic laws are the keystone of the sound-changes in Teutonic languages, but that they are not true without modification when we take into account all Indo-European languages.

(ii) Mr. Ross blames relativists for not having exhausted all the possibilities of the older theory. On their own admission all that we directly know is that the earth and the stars move with respect to each other. If there be an ether this fact is quite compatible with the earth being at rest with respect to it. Now the results of the Michelson-Morley experiment are paradoxical only because the earth is assumed to move through the ether, not because it moves with respect to the stars. And the latter, we have seen, does not imply the former. Mr. Ross's alternative would split into two forms according as he holds: (*a*) that there is, or (*b*) that there is not relative motion between different parts of the ether. On the former alternative both the earth and the stars might be at rest relatively to the parts of the ether in

their immediate neighbourhoods. On the latter alternative the stars would have to be moving through the ether and to have the same velocity with respect to it as with respect to the earth. The former hypothesis has been tried, and is known to lead to conflicts with the facts about aberration. The latter, I think, is the one that Mr. Ross has in mind. It cannot be regarded as plausible to hold that the earth is the one body at rest in an ocean of stagnant ether, whilst the stars are all moving about in it. If the ether be a real physical substance pervading the whole universe, as those who take it seriously enough to entertain either of these alternatives must hold, this second alternative places our small planet in a strangely unique position. But apart from these *à priori* objections, the physical difficulties in any such view are colossal. To account for aberration we shall have to suppose that all the stars describe ellipses in the ether in the period of a year. These ellipses will have to be adjusted to each other in a very intimate way, for which the present theory supplies no explanation. Moreover, considering the extreme remoteness of many of the stars, the ellipses will be of gigantic size, and therefore the velocities with which the stars must move in order to describe them in a year will be stupendous—in some cases of the same order as that of light. Not only are the dynamical difficulties of supposing such large masses to be in such swift motion very great, but the shifting of the lines of the spectrum in light from such stars, due to the Döppler effect, would, I imagine, make stellar spectra utterly different from what they are found to be.

(iii) But Mr. Ross's main difficulty is that he thinks that relativists take absolute motion as a premise in their proofs of the relativity transformations, and that these results are then supposed by them to disprove absolute motion. Before considering in detail whether relativists actually do this we may point out what exactly would be the logical consequences of such procedure. If the observable facts and the assumption of absolute motion imply the relativity transformations, and these in turn imply the denial of absolute motion, it will follow that the facts and the assumption of absolute motion imply the denial of absolute motion. From this we *should* be justified in going on to deny absolute motion. But we should *not* be justified in taking the further step of asserting the theory of relativity. Thus, if the relativistic arguments were of the form which Mr. Ross believes, and if there were no internal fallacy in them, we should be justified in denying absolute motion but not in asserting the theory of relativity.

Actually, however, Mr. Ross is mistaken in thinking that relativists use the absolute theory as a premise to prove the theory of relativity. Let me take my own case, *e.g.*, as Mr. Ross accuses me of this procedure. For didactic purposes I started with the ordinary assumptions of absolute space, time, and motion, and an ether at rest in this space. I then drew a distinction between distances, time-lapses, etc., and our *measures* of these. And I showed that if we wanted to account for such facts as the Michelson-Morley on these assumptions we should have to assume certain physical changes in our rods and clocks when they moved through the ether. The results of these changes are summed up in the transformation equations, and at this stage these may be regarded as expressing the connexion between the distances and time-lapses which we should record if our system were at rest in the ether and those which we should record if we were moving through the ether with an uniform rectilinear velocity. At that stage I was not attempting to prove the *theory of relativity*, but only to prove that such and such relations must hold between our readings when we are in motion and the absolute magnitudes if the facts are to be squared with the *absolute theory*. The next stage is to reflect on these results. (*a*) We see that the physical processes needed to make the absolute theory square with the facts are unnatural in the last degree, and that they have neither the causes nor the consequences which such processes might be expected to have. (*b*) We notice that, since the result of the transformations is that the measured velocity of light will be the same for all systems in uniform rectilinear motion, we may just as well interpret the c of our formulæ as that relative velocity and drop all reference to the velocity of light with respect to the ether, which was its original meaning. (*c*) Next we notice that the form of the equations is such that the transformations from one system to another in uniform relative motion will be precisely the same as the transformations from a given system in motion to one at rest in the ether. We have merely to substitute everywhere in the formulæ the velocity of one system with respect to another for the velocity of a given system with respect to the ether. We can thus reinterpret the v of our formulæ provided we make a parallel reinterpretation of the x, y, z, and t. The v is now to stand for the velocity of one system as judged from a second, instead of the velocity of a single system with respect to the ether. The x, y, z, t are now to stand for the measures of length and time-lapses found by people on the second system, and the transformation equations give us the corresponding

measures of length and time-lapse found by people on the first system. Thus absolute motion and the ether have dropped out altogether, and we are left with equations connecting the measurements of two observers who contemplate the same events. Had absolute motion been a *premiss* for proving these equations, of course we should have no right to reject the premiss and hold that we had proved the equations. But the real position is that the evidence for the equations is simply and solely that they account for the facts. If there be absolute motion it must have such physical effects as to lead to these relations between the measures found by two observers in uniform relative motion, for these relations are found to be necessary to explain the facts. But on the one hand, if there be no such thing the relations will still hold. And, on the other, the facts that absolute motion in any case cannot be observed, that it cannot be inferred from its effects because these are such as never to show themselves, and that the effects which we should have to ascribe to it accord very ill with the rest of our knowledge of nature, strongly encourage us to try to dispense with it altogether.

(iv) The last point in Mr. Ross's paper on which I want to comment is his remarks on simultaneity. His view is that we all know what simultaneity means, and that it always means the same thing. Einstein gives a *test* for it in certain difficult cases, this is never a *definition*, and as such it may be right or wrong, while a definition could only be convenient or inconvenient. I agree in part with Mr. Ross here; but I do not think that the point at issue is so important as he makes out. Certainly I do not primarily *mean* by simultaneity anything to do with light signals. And I do mean *something* by it. But (*a*) I may mean something by a word and not know all that I mean by it. I may think it stands for an absolute term whilst it really stands for a relative one. I talk, for instance, of *the* colour of a piece of gold and only learn afterwards that the colour is not a property of the gold by itself, but is relative to the physical situation in which the gold is placed. Similarly the fact that I mean something by simultaneity, and think that it is an absolute term, is quite compatible with its really being relative to a co-ordinate system. I think the colour of gold to be non-relational because I tacitly assume certain familiar conditions of illumination which are normally fulfilled. In the same way I may fail to notice that simultaneity has an essential reference to a co-ordinate system because I habitually assume a certain familiar system. It does not seem to me that we start life with a clear enough knowledge of what precisely we do mean by

simultaneity to deny this off-hand. (*b*) Granted that we may mean something by a word without knowing with perfect definiteness what we do mean by it, and that this uncertainty allows the possibility of its standing for a relational term, I think Einstein is justified in assigning any meaning to it in doubtful cases which does not fall outside the range of variation of our meaning. He then naturally choses that particular meaning within this range which allows of a definite test and simplifies the statement of the laws of motion as much as possible. This is a general procedure in all sciences, and seems to me to be a perfectly legitimate one. We are not, as Mr. Ross thinks, claiming to give a perfectly arbitrary meaning to a previously meaningless noise; the noise has a restricted class of possible meanings, and we are choosing the most convenient and reasonable one within this range. (*c*) Lastly, if it be granted that relativity *to a co-ordinate system* falls within the range of possible meanings of simultaneity it follows that such relativity as is found need not be to *our minds* or our judgments, as Mr. Ross seems to think. And the fact that we are not dealing here with a relativity that merely refers to our minds and their judgments is proved by the fact that purely physical systems, such as spectroscopes or the moving liquid in Fresnel's experiment, themselves 'recognise' the relativity transformations.

I hold then that, even when we were confined to the special theory, we had good grounds for viewing it with great favour, and that we committed none of the fallacies of which Mr. Ross accuses us in our arguments for it. But I think the general theory is in an even stronger position than the special theory. Let me explain just what I mean by this. Mr. Ross says he will confine himself to the special theory, because, until one has convinced oneself of it, it is useless to worry about the more general one. This seems a reasonable attitude to take, and yet I believe that it unconsciously does an injustice to the theory of relativity. The general theory has in its favour all the arguments that favour the special one, and in addition, certain arguments which do not apply directly to the latter. These arguments consist in the extraordinary unification which it introduces into physics, and the way in which it removes that deplorable scandal which had always hung over the Newtonian laws of motion. The unification of course is that it binds together in a single whole Newton's two great achievements, the laws of motion and the law of gravitation, and connects the two previously independent notions of gravitational and inertial mass. The scandal was the necessity of a particular frame of

reference for Newton's laws. If you took this to be absolute space you had laws which were presumably discovered by observation, and intended for application to the empirical world; and yet they were stated in terms of entities which could neither be observed nor inferred. If you took the frame to be the fixed stars you felt that they were placed in an utterly unintelligible position of importance in nature. It seemed obvious that there must be some way of stating the laws of nature on the one hand entirely in terms of relative motions and positions, and on the other independently of some one special group of material objects such as the fixed stars. To have done this is the great service of the general theory and the overwhelming argument in its favour, to my mind.

To sum up as regards the evidence for the theory:—It seems to me that the general theory starts by shocking us through its unfamiliarity, but that the more we reflect on it and on the mass of perfectly gratuitous and essentially unverifiable assumptions involved in all the alternatives the more certain do we become that it, or something extremely like it, must be true. If men like Prof. Eddington or Prof. Lindemann, who have been constantly and successfully using the methods and results of the theory, were the only people to make the above statement, we might be inclined to discount it somewhat as expressing 'the bias of happy exercise'. But the fact that I am a mere philosopher, quite incapable of their mathematical and physical achievements, may at least serve to allay such suspicions when the statement comes from me.

I will conclude with some remarks on Prof. Eddington's most interesting theory as to the function of the mind in physics. I will not call them criticisms, but rather appeals to Prof. Eddington to clear up some places where his meaning seems to be doubtful. (i) He often speaks as if lengths, time-lapses, etc., were relations between Nature and the observer. He thus seems to make Nature simply the almost unknown referent of these and other relations. Would it not be nearer the truth to draw a much sharper distinction between the 'observer' in the sense of his body and his scientific instruments and the 'observer' in the sense of the observing mind? In the former sense the observer is part of nature, in the latter he is not. And we ought then to say that lengths, time-lapses, etc., are relations between one part of nature and another part of nature, and it is these relations —or the natural complexes related by them—which the mind of the physicist contemplates, measures, and describes. (ii)

I am not sure that Prof. Eddington does not state his selection theory in needlessly subjective terms. To take a crude illustration: Suppose that a number of dots were scattered about at random on a plane. Any three of them would form a triangle and any four of them would constitute a tetragon. The triangles and the tetragons are equally real, and equally parts of nature, and you could completely analyse nature into either. But, on the other hand, only a small number of the points, if any, might be at the corners of squares. Now let us suppose that both triangles and tetragons have properties corresponding to 'conservation'. Then the whole of nature could be analysed exhaustively into entities obeying laws of conservation. If, on the other hand, only squares had the property corresponding to conservation, then, however much the mind might be interested in conservation, it could not give an exhaustive account of nature in terms of conservative entities, and it might be the case that *nothing* in nature obeyed such laws. Now the question I want to ask Prof. Eddington is this. Can *any* four-dimensional manifold be exhaustively analysed into complexes having the property of conservation, as *any* set of points in a plane can be exhaustively analysed into triangles or tetragons? If so, of course, the fact that nature everywhere obeys laws of conservation is in no way due to the mind but to the properties of four-dimensional manifolds as such. The result would be that such laws are necessary in all possible four-dimensional worlds. If not, then the important question would be: Does the actual four-dimensional world in which we live admit of exhaustive analysis into subordinate complexes of this special kind? The fact that the mind happens to like such complexes would of course throw no light on this question. The fact, if it be a fact, that it neglects all other complexes and yet seems able to describe and deal with nature satisfactorily would suggest that probably this condition is pretty nearly fulfilled. For, if there be other complexes and we be so constituted that we neglect them, it does not follow that they will neglect us. And we should therefore expect to get into serious practical and theoretical difficulties if the bent of our mind caused us to ignore types of complex which are real parts of nature and cannot be analysed into the complexes of the types that we do notice.

Scientists generally and rightly neglect the existence of minds while going about their lawful business. When at a later stage minds are forced on their attention they tend to be embarrassed. If they be stupid they deny minds altogether, which seems to be the last asylum of the dogmatic biologist. If, like Prof. Eddington, they have too much sense

to do this, they are liable to go to the other extreme and, taking *omne ignotum pro magnifico*, to ascribe to minds powers and functions which they probably do not possess. I do not assert that Prof. Eddington has made this mistake but I have my suspicions.

IV. By F. A. Lindemann.

The difficulties of Mr. Ross seem to have been dealt with very completely by Mr. Broad so that I will confine myself to an attempt to restate the general case for Relativity in its simplest form in the hopes of providing a basis for discussion.

For this purpose I propose to examine the question why we study physics and attempt to establish the relation between physics and metaphysics. Then to state the impasse which led to the special theory of relativity, and finally to explain the essential difference between the general theory of relativity and the Newtonian point of view.

Mankind has evolved in the course of ages amidst hostile surroundings from the position of one of the minor fauna to that of unquestioned master. Whatever may be the reason for this we cannot therefore be surprised if man has many attributes of considerable survival value. There can be little doubt that one of the most valuable characteristics from the survival standpoint would be the faculty of forseeing future events, and it is not to be wondered at therefore that those races and men who have survived have an innate tendency, possibly strengthened by tradition, to seek to correlate events and establish relations between phenomena, which will enable them to predict subsequent happenings from observed data. The more easily such relations or laws are assimilated and applied, the simpler they will appear, hence the human mind, being what it is, always tends to accept the simplest laws consistent with observed facts.

Physical laws, and probably all laws, are based on observed phenomena. In order to establish a law a physicist observes a phenomenon under various conditions, formulates a hypothesis to account for the results, extrapolates new consequences of his hypothesis, tests these empirically, if necessary modifies his hypothesis, and so on. In this way, by a series of successive approximations he arrives at a rule or law or formula which is valid for all his experiments, which should be valid for all experiments carried out under conditions intermediate between those actually tried, and which is often valid when extrapolated for a considerable distance beyond

the observed instances. A man with this physical habit of mind may occasionally be misled by insufficient data, but when this happens his constant empirical checks inevitably show him his error and cause him to recast his theory.

We may contrast with the physical habit of mind, which we all have to a greater or less extent, what may perhaps, for want of a better term, be called the strictly logical habit of mind which occasionally survives in universities and other secluded regions. A logician of this type refuses, at any rate in theory, to believe that it is possible to learn by experience or extrapolate from observed repetitions. In his view the fact that the sun has risen a million times in succession does not provide any reason for believing it will rise again. He says one must either know or admit ignorance, and deplores our tendency to simple extrapolation. One can imagine occasions upon which the logician might score at the expense of the physicist who frankly admits that he does not know, but finds it pays to extrapolate, *e.g.*, at Monte Carlo, where the logician should never even be tempted to invent a system; but in the infinitely more numerous and important affairs of daily life the physicist would survive whilst the logician would perish. Still some individuals with a tendency to this type of logic, or better still some chromosomes or chromidiae, which predispose an individual to such a dangerous habit of mind, have managed to survive. They have done this by making a new and perfectly undemonstrable assumption, namely, that certain things or laws are "self-evident".

Making such an additional assumption of course complicates things and thereby diminishes the probability of the survival of the individual characteristic; but it need not diminish it very materially if the "self-evident" truths are judiciously selected. Clearly any member of the congress who inclines to the "logical" point of view has survived and he would not be amongst us to-day unless his self-evident laws approximated to our physical laws. The danger of course lies in the fact that a "self-evident" law, once it rises above the level of a mere definition or tautology, is always liable to be upset by new experimental evidence.

Now the law may be "upset" in two ways, so different quantitatively that they may almost be considered qualitatively different, and it is this difference which, in my opinion, forms the only distinction between physical and metaphysical statements. As an instance of a physical statement, than which few things could seem more "self-evident," we may instance the claim "that water is continuous and homogeneous".

This involves the claim that it would be possible in principle to subdivide a drop of water into an infinite number of particles, each of which would have the properties of water. We have every ground for believing that if it were possible to cut a drop into eight equal parts by three perpendicular cuts, and repeat this process some twenty-five times, we should arrive at something very different to water, namely, hydrogen and oxygen. To refuse to believe this because the continuity of water appears self-evident would practically amount to repudiating the whole edifice of modern chemistry and physics. The number and complication of supplementary hypotheses that would have to be made in order to take account of observed facts, would be so enormous that a physicist must refuse to contemplate such an alternative.

As an instance of a self-evident truth of the second type we may take the geocentric system of cosmogony "self-evident" if anything can be. Why was this system superseded by the heliocentric system against the tradition of centuries, the authority of religion, and the efforts of the secular powers? Only because the Copernican system is simpler. Both systems are capable of accounting for all the facts, and it is really surprising how quickly the simpler theory supplanted the more complex merely by virtue of its simplicity against all the weight of prejudice, and in spite of its "self-evident absurdity". Its acceptance is an inspiring proof of the innate tendency of the human mind to assume that which is simple and manageable, and which therefore tends to the preservation of the race.

The difference between the two examples is clearly one of degree rather than of type, but the difference of degree is enormous. The geocentric system could be worked, though with more effort than the heliocentric. The denial of the discrete nature of matter would probably involve complications which would transcend the capabilities of the human mind. From this point of view, therefore, a physical statement is one which it is impossible to give up without revolutioning science, whereas a metaphysical statement is one which forms a convenient basis for describing phenomena, but which has scarcely more importance intrinsically than has the choice of co-ordinates in geometry.

It is difficult, if not impossible, to say just how much gain in simplicity is necessary in order to justify us in believing that a certain theory is intrinsically true rather than merely convenient. Here again we must trust to the inherited tendency of the mind to draw the line. But most people will agree that there is a vast difference between assuming, say,

that the earth is round, because this is the simplest way of accounting for the observed facts, and assuming that the earth is divided up into parts by lines of latitude and longitude because these provide the easiest way of specifying a point on the earth's surface.

In my opinion the Principle of Relativity is what has been defined above as a metaphysical principle, and we are now in a similar position in respect to the theory of Einstein that Galileo occupied with regard to the cosmogony of Copernicus. We find it hard to give up our prejudices in favour of a strict distinction between space co-ordinates and time co-ordinates, and in favour of a strictly Euclidean space merely because it simplifies the laws of physics. To do so requires a mental effort which, in the opinion of some, is not compensated by the gain in simplicity which results. But our notions of space and time are essentially metaphysical conceptions, and as such are clearly merely a matter of convenience or even of taste. The older generation may, therefore, be justified in refusing to accept the new doctrine and sticking to its "self-evident" truths at the expense of simplicity, but as in the astronomical parallel we must look for progress and discovery to those whose elasticity of mind enables them to make themselves familiar with the new point of view. Neither standpoint can be said to be right or wrong since either enables us to represent the facts adequately, in fact, as mentioned above, the difference is not so very much greater than one of a choice which co-ordinates one will adopt. But the old theory panders to outworn prejudices at the expense of simplicity, whilst the new will probably seem as obvious and natural in a generation as the Copernican theory does to us to-day. Just as the change from the geocentric to the heliocentric cosmogony denoted a momentous emancipation of the human intellect, so does a grasp of the theory of relativity enable us to look with a much wider and broader view on the systems and philosophies of the past.

As a basis for discussion it may be worth while to set down once again in the baldest form the experimental facts which seem to show the desirability of reconsidering our opinions, firstly, as to the sharp distinction between space and time co-ordinates (special theory of relativity) and secondly, as to whether space, or if the first thesis be accepted the space-time manifold, is Euclidean (generalised theory of relativity).

Perhaps a brief, almost historical, analogy may be interposed, which illustrates the situation which led up to the special theory of relativity. Let us picture a primitive community in which height is rigorously distinguished from

length and breadth. This distinction might well appear fundamental since work must be done in order to raise an object, whereas it can be moved in a horizontal plane without effort. As long as the members of the community believed the earth to be flat, they would consider it just as easy to distinguish height from the horizontal dimensions as we tend to think it is to distinguish time from the spatial dimensions.

Now suppose an observer on the top of a tower observed a distant tower with a theodolite. If both towers were of equal height when measured in the usual way by means of a plumb line and a foot rule, our observer would expect to find that his theodolite was level. On account of what we call the depression of the horizon he would of course find that he was obliged to point slightly downwards. At first he might attribute this to some peculiarity of the air, but when he found the same phenomenon whichever eminence he ascended, he would be forced to seek a more general explanation. The first that would occur to him would probably correspond to the Lorentz-Fitzgerald contraction. He might say that the mere fact of ascending distorts the scale of the theodolite and elaborate a consistent but complicated system on these lines. A really clear thinker, who would free himself from prejudice, might however proceed as follows. He would say, this distant tower is lower than mine for my theodolite measures its height. Therefore when I drop a plumb-line from it and measure the length the plumb-line cannot be parallel to my plumb-line in my observatory. But my observatory is in no way pre-eminent above any other spot in the world, therefore I cannot say my plumb-line is truly vertical and measures height, whereas all others are deflected towards me. Hence the direction which we call height must vary according to which part of the earth's surface we are at and what I call height must appear to be composed of height and horizontal distance, for anybody else and *vice versa*. The simplest way in which I can express this is to say that the surface, which I have been taught to call plane is curved and to say that height is the direction normal to this surface.

It is not necessary to picture the scepticism with which such an argument would be met in detail, how the unfortunate originator of the theory would be told that everybody knew what height was and that to try and compound height and horizontal distance was as foolish as to mix space and time, and how he would be finally overwhelmed by some philosopher pointing out that his theory logically involved the possibility of Antipodeans. Such a description would apply to events even yet too recent to be altogether pleasant. But

though the analogy is obviously imperfect the results of the Michelson-Morley experiment put us in a very similar predicament to that pictured above.

Unless we assume that the earth is altogether pre-eminent in the universe and that the Michelson-Morley experiment, which yielded a purely negative result on the earth would show a positive result on any and every other planet, we can describe it, making use of Majoranas' results, in the following way.

If two observers moving past one another sent out a light signal at the moment they are in contact this signal will spread out as a shell of light. Although they are moving away from one another, each observer will find as the result of the most accurate measurements that he is and continues to be at the centre of the expanding shell of light.

If the shell of light has objective reality there is only one explanation for this, namely, that the standards of length and time used by the two observers, which agree when they are at rest relatively to one another, do not agree when they are not at rest relatively to one another. If the two observers A and B are moving with the relative velocity V it is easy to specify the exact change of the units of length and time which would lead them both to conclude, as really happens, that they are at the centre of a spherical shell of light expanding at velocity C. This change is expressed uniquely by the Lorentz transformations and is such that A considers that B's measurements of length involve what he, A, calls length and time, whilst B considers that A's measurements of length involve what he, B, calls length and time. The same holds good for measurement of time. Each observer finds that the other observer must be measuring a quantity involving both time and length when he thinks he is measuring time.

Now no observer is pre-eminent above any other and therefore neither can claim that he is right and that the other is wrong. Each considers he is separating length and time in the one obvious unique way and yet neither is separating them from the other's point of view. The obvious conclusion is that they are both viewing the same event in a four-dimensional space-time manifold from a slightly different angle. This is precisely what the equations of transformation which may be found as shown above indicate to the mathematicians.

An event implies both spatial and time relations and in order to describe it we introduce space and time co-ordinates and represent it in a four-dimensional manifold. The achieve-

ment of the special theory of relativity consists in having shown that there is no unique way of separating space and time co-ordinates but that observers moving relatively to one another will separate them in different ways. Objective reality belongs to the event, its description in terms of space and time varies and depends upon the observer: space and time are thus relegated to the secondary role of convenient co-ordinates personal to the observer which he uses in order to describe events.

The main philosophic advance to be claimed for the generalised theory is to the emphasis it has laid upon the fact that the conceptions we choose to form about geometry in the four-dimensional space-time manifold which forms our universe are entirely arbitrary. Again it is purely a matter of convenience which geometry we adopt.

There is no meaning in saying any particular geometry is true or false, that space is Euclidean or non-Euclidean, homaloidal or not, for space without objects is inconceivable. Therefore any statement about space really consists in a statement about objects, preferably solid objects. It is readily seen that here a wide range is open. Thus if anybody chooses to affirm, for instance, that the linear dimensions of all objects in a room contract to one-half when turned from a N.S. direction to an E.W. direction, it is impossible to prove him to be wrong. Clearly his measuring rod will contract by the same amount so that the fact that the measured length does not alter proves nothing. The only objection to such a scheme is that it involves complicated laws of physics.

Take, for instance, the elementary mathematical treatment of a game of billiards on these assumptions. Two balls moving E.W. and W.E. may be made to collide at such an angle that their directions are changed to N.S. and S.N. respectively. Neglecting friction their speeds appear to remain the same. But if we assume that the E.W. dimensions are one-half of the N.S. dimensions the speeds, which appear unchanged, must really be doubled and the kinetic energy must have increased to four times its original amount. If we desire to make the above assumption about our geometry, or space, or perhaps best of all about the properties of solids, and yet retain the laws of the conservation of energy and momentum we can only do so by making special assumptions, *e.g.*, that E.W. kinetic energy is four times as great as N.S. kinetic energy and E.W. momentum twice as great as N.S. momentum. Similar arbitrary assumptions would be required in order to account for other phenomena, but there is no doubt that a consistent system of laws could be evolved

to fit an anisotropic space. The objection is, of course, that such a system would be very much more complicated than the system we use. In view of our innate tendency to adopt the easiest and simplest system therefore we usually assume space to be homaloidal.

For the same reasons we have hitherto assumed space to be Euclidean, namely, because this appeared to lead to simple and convenient laws of physics. It was Einstein who first pointed out that even simpler laws result if we give up this assumption which long usage has rendered almost a necessity of thought to some minds. The simplification is perhaps best seen if one tabulates the postulates necessary to account for observed facts in gravitational physics on the bases of Newton and of Einstein.

From the absolutist point of view we must assume :—

1. That bodies unaffected by other bodies follow the shortest paths, *i.e.*, that their four-dimensional world lines are unique.
2. That space is everywhere Euclidean.
3. That bodies or energies attract one another with a force proportional to the product of their masses.
4. That this force varies inversely as the square of the distance.
5. That a quasi-magnetic force acts upon bodies or energies moving relatively to one another.

From the relativist point of view we must assume :—

1. That the four-dimensional world lines of bodies or energies are unique.
2. That the curvature of space is proportional to the mass.
3. That it is inversely proportional to the distance.

The absolutist system introduces a mysterious entity called force and requires five assumptions at least. The relativist system yields all the same results with but three assumptions. The latter, therefore, appears preferable, but to say that one assumption is true and the other false would be just as meaningless as to say that space is or is not homaloidal. Either point of view is perfectly justified, but the one appears simpler, and, therefore, more convenient than the other. It would be unwise, though nobody could say it was wrong, to attempt to use Cartesian rather than polar co-ordinates in discussing curves such as spirals. If a mathematician existed who had never studied trigonometry or heard of polar co-ordinates, he might consider it better to treat the problem in this way, in spite of the complication, rather than make the mental effort necessary in order to familiarise himself with a new world of sines and radii vectores.

No man can estimate his neighbour's mental elasticity, and no man, therefore, has the right to condem another who refuses to embark upon an adventure for which he must dispense with the sword of self-evidence and the armour of prejudice, in which most of us are entrusted, and rely upon forging new weapons as he goes along. Each man must be the judge of his own limitations. But there seems little doubt that the future will belong to those who are able to realise when their mental accoutrement has become so unyielding as to be more of a hindrance than a help, and who have the courage and initiative to cast it aside and adopt new methods rather than wait until their own have been superseded.

III.—DO WE KNOW OTHER MINDS MEDIATELY OR IMMEDIATELY?[1]

By Joshua C. Gregory.

A little oil, when shaken vigorously with water, is dispersed through it in separate droplets. So our human minds appear to be dispersed as separate centres of consciousness through a continuous material world. To vary the metaphor, they seem to be scattered through the world of space and matter like islands in an archipelago. These attempts at visual representation, inadequate and even misleading though they may be, assist a mental grip on two ways of conceiving the possibilities of communication between mind and mind. As two droplets of oil, though separated by water, can draw one another, so two minds may communicate directly, without assistance or hindrance from the medium in which they are dispersed. The first settlers in the Ægean could only communicate between their islands by raft or boat. As the sea, which separates islands, also provides a connexion, so the material world may permit communion between minds.

Minds do communicate via the material world. Language, including in its widest sense the whole range of significant action from a faint bodily tremor to the most elaborate speech or writing, uses this instrument. Every human body is elaborately equipped for seeing, hearing, touching, or smelling, and through these senses the actions of other human bodies are perceived; it is also elaborately equipped for actions or movements that can be perceived through the senses of other bodies. Each human mind is intimately connected with such a body, which is a specially and highly organised part of the material world. The extraordinary complexity of these mediums of communication between mind and mind suggests

[1] A criticism of Mrs. Duddington's article in the *Proceedings of the Aristotelian Society for* 1918-19, on "Our Knowledge of Other Minds". Mrs. Duddington infers from neo-realistic principles that we know one another's minds as directly and immediately as we know physical things. She attempts to criticise away "the usual psychological doctrine" that minds know one another indirectly. This "usual psychological doctrine" is here shown to be adequate.

that minds are confined to this method of intercourse and thus forced to organise it to the utmost. This hint is so far confirmed by experience and reflexion that in traditional psychological doctrine minds only become aware of one another by indirect inference from bodily actions.

This traditional doctrine may simply have succumbed to the temptation of the apparently obvious. Many things seem obvious up to a certain point; then obviousness becomes doubt and doubt may become denial. It may be long before doubt can seriously disturb the persistent enticement of a broad apparent obviousness, and it may be so with the belief that we can only know one another's minds by observing one another's bodies. Remembering that this belief may seem obvious and yet be false, it is first necessary to understand why it does seem so obvious that mind can only know mind through bodies, connected in their turn by the physical world. A wave of the hand seen by an eye because light passes between the two informs one mind of the gladness of another: this seems to be typical of the sole method by which minds communicate.

The hands of any person, the boots he wears and the pen he handles are open to public inspection; the thoughts passing through his mind are not. He can, by speaking or writing, tell his fellows what these thoughts are or were. In speaking he uses movements of his body, and the air, and thus appeals through the bodily modifications involved in the hearing of his auditors to intimate these thoughts. When he writes them down the visual senses of his audience receive his message transmitted via pen, paper and ink—all parts of the material world—from movements of his hand. The communication between mind and mind of complex trains of reasoning or of thought in mass seems to be essentially accomplished by a physical route between them and to depend for that accomplishment upon the establishment of such a route. The steady elaboration of speech and writing, by opening more freely the physical routes of communication between minds, as rail or motor allows freer access from town to town, forcibly impresses the conviction that minds know, and can only know, one another indirectly through the material world in which they appear to be separated centres. The curt symbolism of developed language, so quickening to intercourse, emphasises the mediation of the physical world in mental intercommunication.

Toothaches, loves, angers, desires, or resolves, seem to be as concealed from public inspection as the most abstract thoughts. They too can become known through speech and

writing. Emotions like anger or fear usually lie more open to view because they more spontaneously express themselves in characteristic gesture or action. The dependence of the inspecting mind upon information received from the mind it inspects through the actions of the bodies' they inhabit becomes evident when it is deprived of these indexes to conscious life. A statue can express fear if it be cast in the attitude and expression associated with that emotion. It is tied to this one expression because it cannot alter to the attitude and expression associated with anger or joy or love. It may be so neutrally cast that it suggests virtually no mental state at all. As a human being approaches the immobility of a statue, his thoughts and feelings retire from the view of others: it becomes less and less possible to discover whether he is angry or pleased or in pain. If he lie paralysed by a "stroke" his friends cannot be certain whether he recognises them, whether he is suffering, even whether he is at all conscious of his surroundings. In such tense moments we seem to realise that we can only know one another's minds by observing one another's bodies. Death has always produced the conviction that the soul has fled or that the dead man is no longer conscious, because the body gives no hint of thought, affection, or recognition.

Thus every hint we receive, whether it be accepted as mere hint or regarded as a positive declaration, about the thoughts or feelings or resolves of others seems to originate in significant movements of their bodies. Spoken and written words do not habitually remind us of the bodily movements of mouth or hand behind them, we also think less of the gesture than of the emotion it signifies; but, ultimately, every intimation received by one mind from another appears to be open to inspection only up to some movement in the body of the latter. Behind these movements, open to inspection in principle if not always in fact, lie the *inferred* thoughts, feelings and mental states and processes in all their infinite variety which are intimated by these movements. This inferred knowledge that other minds are angry or happy or thinking about their "knowledge of other minds" seems also to depend upon our own private experiences of anger or other mental conditions. We can know, to put it shortly, that others are angry because we have been angry ourselves and have expressed our anger in similar movements. Our dependence for our knowledge of other minds upon their similarity to our own and upon their expression through similar actions in similar bodies forces itself upon attention when we attempt to understand the minds of beings differing from

us in conscious life and in bodily organisation. McCabe, in his *Evolution of Mind*, affirms that there is no need to admit consciousness at all in the animal world as far up as the wasps and bees. His denial is significant because it might be true and because it is impossible to refute. We are less certain that he is wrong in doubting whether even birds are conscious than we are that he would be wrong in denying consciousness to Australian Aboriginees. We suspect that birds have pleasures just as we have because they seem to enjoy worms as we enjoy pancakes; we cannot entirely remove McCabes' doubts because birds are so different from ourselves. Our conviction that Australian Aboriginees have minds essentially like our own seems to depend upon their closer resemblance to ourselves. If we were not dependent for our knowledge of other's mental processes on their resemblance to our own and on their expression through movements similar to ours in bodies like our bodies, we should not expect to experience such serious difficulties as we do actually experience in determining whether humble organisms like paramecia have any consciousness at all. If Mrs. Duddington were right in claiming that "Our knowledge of other minds is as direct and immediate as our knowledge of physical things"[1] why should McDougall be compelled to an attempt to deduce consciousness in amœbæ from the tactics employed, so graphically described by Jennings,[2] when a big amœba chased a small one?[3] Why should we be uncertain whether "the loves of the plants" be only poetic fictions or be unable to deny that a plant turns to the sun to enjoy its light? If we could know other minds directly and immediately we should be able to disregard their unlikeness to ourselves in structure and habit and realise whether they had consciousness or not.

The dependence of our knowledge of other minds upon private experience appears in the failures of human beings to understand one another. Little children cannot understand all the motives and thoughts of their elders because their own little private experiences must first be widened. The little girl who tends her baby brother may perhaps receive a hint of parental solicitude; no child, it seems impossible to doubt, can understand the adult attitude towards itself until it has in its maturer years realised how childish naïveté, freshness, imperfect apprehension of life's significances and need of protection appeal to those who have left child-

[1] "Our Knowledge of Other Minds," *Proc. Arist. Soc.*, 1918-19.
[2] Behaviour of the lower organisms. [3] Body and Mind.

hood far behind. Differing interests raise misunderstandings between men or prevent them from understanding one another; the pigmy and the giant seem to belong to different worlds; men of differing speech begin their understanding of one another in the most fundamental parts of life—just at those points where common feelings and common modes of expression provide a basis of inference. A child can see that his father is angry: he too has been angry; he cannot understand his father's interest in politics. A savage can understand at once that the explorer who has just landed is hungry or friendly: he has been hungry or friendly himself; he is confined by dissimilarity of experience to an imperfect comprehension of the new mind that has come within his ken.

Our knowledge of other minds seems to be the inverse of our knowledge of physical objects. To know that other minds are angry or can be angry we must have been angry ourselves. We can apprehend the hardness of objects without being hard ourselves or perceive colours without being similarly coloured. The community of nature that seems necessary for apprehending minds and unnecessary for apprehending physical objects appears to be connected with an indirect mode of apprehension that contrasts with the direct immediacy seemingly characteristic of sense-perception.

Protests are expected against believing that minds can only know one another through a physical medium, and protests have been strongly made. Fechner thought that the very nature and being of spirits ought to bring them face to face. F. W. H. Myers compared the direct telepathic action of mind on mind to the pervading gravitational attraction between all particles of matter—minds may be separated centres like the oil droplets dispersed through water, but they can act on one another directly as two oil globules pull at one another independently of the water between them. These protests come down from above, but protest also springs directly from the belief itself in the inferential nature of our knowledge of other minds. We are so certain that other minds exist; we are so certain that they resemble our own; we are so certain that they feel pain, evince anger, experience joy just as we do ourselves; so certain they see mountain, moor and flood, and so certain that they have thoughts like our own thoughts. A complex analogical inference seems quite an inadequate support for such certainty. If we do compare the behaviour of other bodies with our own, and infer from our own mental states behind our own bodily actions that similar minds are behind the similar bodily actions of others, we succeed in imparting to this inference an absolute-

ness of belief virtually unattainable in any other inference. We seem wilfully to insert a paradox in the very heart of our certainty if we persist in believing that one mind can only know another indirectly through body and the material world.

The doctrine of indirect physically mediated intercourse between minds must be thoroughly explored to determine whether it can remain unimpaired by critical analysis. Such exploration is demanded by those who discover a conflict between this doctrine and fundamental principles of their own. If telepathy be true, direct knowing between mind and mind, we are not confined to observing one another's bodies for knowledge of one another's minds, though we may have dropped into the habit of depending on this method. Mrs. Duddington has been compelled to criticise the doctrine of dependence on physical mediation by deductions from neo-realistic principles. These principles converge on the conclusion that this dependence is neither absolute nor, at bottom, essential. The success or non-success of her criticism is thus widely significant. Her success would support the neo-realistic movement; her non-success would supply a corrective to it. Now, if her criticism is criticised in its turn, it seems clear that she has not succeeded.

Children rapidly realise that they are surrounded by other minds. If they reach this conclusion by the inferential route, they perform, Mrs. Duddington urges, a miracle of analogical inference. She depends, in endeavouring to force this concession upon us, on a misrepresentation of the nature of inference. Adults infer from bodily expressions to minds behind them so habitually that they are unconscious of drawing any inference—they seem to recognise suffering directly, because they pass so promptly from its bodily indications to the pain they intimate. Mrs. Duddington ignores some patent facts of experience when she argues that even if children drop very quickly into this unconscious, habitual, inferential method they must have passed through a period of formation when they explicitly argued: we cry when we feel pain; those children are crying; therefore they feel pain. Explicit conscious inference is the genetic successor, not the predecessor, of implicit unconscious inference. Children learn to *see* that stones are hard. This is inference, for hardness, which cannot be seen, is inferred from a stony look. Such inferences, spontaneously, unconsciously, implicitly springing from experience are the foundation of all mental life. One first office of consciousness is to interpret the present situation through past experiences.

These past experiences interpret the present situation *for* consciousness, both in the evolutionary development of life and in the development of the human individual, before the mind learns to refer, consciously, deliberately and explicitly to its past in order to deduce from it and establish logical canons for its deductions. Inference is like walking or speaking, like all perception, thinking or imagining: it is done before it is realised or brought under consciously realised conceptions. The more fundamental the inference, the more inevitable its original implicitness. The child learns from its own pain, pleasure or anger associated with bodily manifestations to perceive from similar bodily manifestations the possession by other minds of similar feelings or emotions in the same spontaneous way as it learns its inability to touch an object that looks far away.

A similar precedence of implicitness over explicit thought disposes of Mrs. Duddington's criticism that there is no reason for believing in the priority of the awareness of our own mental life to our awareness of the mental life of others. Explicit logical exposition begins with the percipient's own conscious life, proceeds through his own bodily manifestations to those of others and ends in the conscious life behind the last. Logical exposition is no direct translation of psychological genesis. The child acts and thinks like a self before it knows that it is one; it responds also to other persons as if they were persons before it conceives them as selves. Its own conscious experience, its own bodily habits and the impressions made upon it by other people's behaviour, organise its own actions and sense of life into a complex of reactions, physical and mental. The ultimate recognition of its private self among other selves depends, among other things, upon the direction of attention and the flow of interest. The organism faces outwards, with its mental no less than with its bodily eye: interests come from the outside and attention sallies to meet them. Mrs. Duddington may affirm rightly that the *idea* of the *other* self comes first, alike in primitive man and in children; she deduces wrongly if she supposes the priority of this explicit affirmation to intimate a priority of implicit apprehension. Psychologists, she remarks, fear questions about the age when we escape from solipsism by making our momentous inference. This "momentous inference" is continuously manufactured from the beginning of experience. Solipsism arrived late in philosophy because we think about things long before we think about our thinking. None the less our thinking about things is as original for us as the things we think about. The child defers re-

cognition of its dependence on its own conscious experiences and on the inferential nexus between mind and mind provided by bodily actions; but deferred recognition is no disproof of existence.

Mrs. Duddington calls in Lipps as assistant critic. An observed analogy, such as is involved in physically mediated knowledge between minds, implies, according to this psychologist, remembrance of past experiences. If she means that we ought to remember our childish analogical arguments from our own selves to the existence or nature of other selves she is again misrepresenting a spontaneous movement of thought as a formal, explicit, logical procedure. We do not remember how we connected a stony look with the hardness we infer from it. It requires reflexion to discover the element of inference in all our perception which was spontaneously or unconsciously wrought in by experience. Memory is primarily a reaction to, or spontaneous illumination of, a present situation through tendencies impressed by past experiences. It is only secondarily a deliberate, conscious reference to these. Hens expect food when they see their owner with a tin because they have been previously fed on like occasions. Their expectancy could be generated from previous experiences without their reinstatement in recollection or without any capacity for such reinstatement. The child does not deliberately remember that he laughed when he was pleased and deliberately infer from the laughter of his mother that she too is happy. He spontaneously apprehends his mother's pleasure from her laughter because primary, unconsciously acting memory connects the present situation with past experiences. The mind connects experiences into realisations long before it becomes conscious of these connexions or attempts to make them deliberately.

Mrs. Duddington adopts another criticism from Lipps. The percipient's view of other people's behaviour differs from his view of his own: he sees the one and feels the other. But surely a child knows that he tries to escape when he is frightened and can see that others try to escape in the same way? We certainly do learn to understand that the movements of others which we see are the same as our own movements which we appreciate mainly from sensations in our muscles, tendons, joints and the like as we make them. We make these fundamental connexions between our own movements as we feel or partially see them and the movements of others which we see, as we make all our fundamental connexions, unconsciously, spontaneously and implicitly. Lipp's comment

complicates the essentially inferential process of knowing one another's minds, it does not expose it as a fallacy.

Mrs. Duddington calls Lossky as a witness to the infection of every analogical argument by dubiety. It is true that the conclusions of most analogical inferences are only probable, though they may be very probable. Our supreme faith that other minds like ourselves exist seems, however, to have a special reason. We cannot escape from belief in the external world because we have always to adjust ourselves to it. A precisely analogous adjustment to other minds is constantly required of us. It is impossible to steal as if there were no policemen, impossible to telephone or go to church or read articles as if no other minds like our own existed. Since their presence is forced upon us by their actions it is consistent to suppose that these actions lead us to recognise it. The external world may not appear to us as it really is, for its intimations are received by minds that are not external worlds. These may misunderstand what is unlike them because they have not in themselves what they seek to discover. In knowing other minds we do discover what is in ourselves. Our certainty that other minds exist and that they resemble our own is derived from our most certain knowledge, however it be explained, that we do love, hate, think and reason.

Mrs. Duddington gets into still deeper waters when she insists that if a child can become aware of living things it can "contemplate," or apprehend directly, both the physical and mental aspects of a complex reality. She is commenting on Prof. Laird. Prof. Laird assumes that the child first distinguishes responsive from unresponsive beings; then by gradual unconscious logic it compares these responsive beings with itself. A baby knows the difference between mother and perambulator before it knows what the difference is; the child is aware of minds before it knows they are minds. The behaviour of living things, especially of conscious beings and most especially of human beings, is enough to impress upon the child their difference from inanimate things. Stones do not wriggle like worms and perambulators do not cuddle or lift or slap like mothers. It is quite gratuitous to suppose, as apparently Mrs. Duddington does suppose, that the infant perceives from the start the life in the worm or the mind in the mother that behaves so differently from the perambulator which she wheels. The responsive behaviour of the mother, surrounding the infant with tendance, singles her out uniquely, and singles her out uniquely for ultimate recognition as a mind when the infant's experience qualifies it for this spontaneous recognition.

We are rapidly aware of suffering, joy or affection in other minds because we are so familiar with personal behaviour. Mrs. Duddington seems suspiciously near quibbling when she argues that no introspection will "detect the slightest time-interval between our perception of a person's tears . . . and our awareness of his grief". Would it detect the "slightest time-interval" between hearing the words of a speech and appreciating their meaning? When the sentence is given the meaning is given. If we read gesture even more rapidly than we read print it is because we are so sensitive to the cues of personal behaviour. Human intentions are sometimes doubtful, just as the meanings of sentences are sometimes doubtful. In observing a gesture from a distance it is possible to be in doubt and is it certain that introspection would not then reveal the slightest time-interval between noting a distant wave and inferring that some one was afraid? If it be true that "The physical and the mental sides of the complex before us are apprehended together at one and the same moment of time, and they stand on the same level of psychological certainty," our ability to know a person's mind and to perceive what his gestures are vary in a remarkably parallel manner. Much apparent marvel disappears from the rapidity and certainty in our apprehension of other minds when we remember how the totality of our experience co-operates in that apprehension: context illuminates quickly and vividly. We know that most people are getting hungry at twelve o'clock; if our elderly neighbour runs out of his gate we are prompted by realising that business men catch trains; a frightened child and an inquiring bull-dog need no special immediate apprehension of the mental side of the "complex before us". Situations are constantly illuminated by past experience as pressing a switch lightens a dark room. How rapidly we dodge when a motor-horn sounds or realise from a whistle that we are late for our train! We are familiar with situations, we are familiar with minds, we are constantly watching their expression in bodily behaviour: there is nothing miraculous, unless in the sense that anything is miraculous, in our rapid and, on the whole, sure knowledge of how minds feel or think.

Mrs. Duddington's path of unsuccessful criticism is also strewn with some curious incidental deductions. We are directly acquainted with minds but cannot perceive them alone because they are always connected with bodies. There is some plausibility here, though we do perceive dead bodies alone. If habitual conjunction prevents us from perceiving minds apart from their bodies, in a dark room, for instance,

if we have no cue to their feelings or thoughts, it might be expected to preclude us from perceiving bodies without minds. All theories of direct acquaintance or action between minds have to assume that this immediacy is habitually dropped in favour of the mediate route through the physical world: the habit of accepting bodily actions as signs of inner states represses the method of immediate apprehension. Mrs. Duddington recognises that in practice "the more a mind 'withdraws into itself' and shrinks from attracting the notice of others, the more difficult it becomes for outsiders to become aware even of the emotional parts of it". No adequate reason for this is apparent, if it be true that the mind is originally endowed with the capacity of immediately apprehending other minds. Men have as much interest in their fellows' intentions as they have in external objects. If the mind have a power of perceiving minds analogous to its power of perceiving physical things why should it not retain both methods—persist in retaining them? In sense-perception physical objects are habitually observed separately from minds; why should "mind-perception" not be persistently employed to make the perceiving mind independent of bodily sign or gesture. A plausible reason can perhaps be given. The one method of sense-perception suffices for knowledge of the physical world and of animate bodies; it also, by inferential assistance from the mind's own conscious processes, suffices for knowledge of other minds. Since one method can replace two, economy makes the substitution. When the child has once apprehended minds he gradually restricts his knowledge of them to the one route of sense-perception, which informs him both of physical things and, conjoined with an inferential supplement from his own conscious states, of other minds.

There is less plausibility in Mrs. Duddington's assumption that sense-organs are instrumental to sense-perception by an accident of our psycho-physical organisation. The complexity of neural arrangements suggests the expenditure of considerable effort to bring consciousness into touch with the world. This suggests, in its turn, that the mind is compelled to use these arrangements to obtain its perceptual grip. The absence of corresponding organs for the apprehension of mind by mind leads Mrs. Duddington to infer that neural arrangements for perception are accidental. She concedes a startling priority to function over organ by declaring that since knowing is essentially discrimination there is no *a priori* reason against the discrimination of anything. Perception discriminates particulars, why should minds, therefore, not be perceived? We cannot see when our eyes are blinded, nor

can we hear when our ears are destroyed. The discriminating function seems to run parallel with the perfection or imperfection of its organ. The psycho-physical organisation very successfully simulates a dependence of discriminative power on adequacy of organ if it be merely accidental and not necessary. It is not intrinsically impossible but it would certainly be strange if the mind began by surrendering a universal discriminative power to the caprices of neural arrangement in limiting its ability to perceive physical things, and then consented to confine also its ability of apprehending minds to the same caprice of neural organisation.

There is no real warrant for Mrs. Duddington's condemnation of "the usual psychological doctrine that knowledge of minds is indirect". An elaborate neural organisation secures perceptual contact between mind and world. The mind has no apparent organs for direct apprehension of other minds. Minds do communicate via bodily actions. Community of nature provides a basis for certainty of inference when one mind knows another. Criticism cannot discover an incompetency in consciousness to realise from the association between its own processes and its own bodily actions that behind other bodily actions there are consciousnesses like unto itself.

IV.—SOME MODERN ÆSTHETICIANS.

By H. R. Marshall.

That beauty is subjective rather than objective is a tenet which has become prominent in the modern consideration of Æsthetics as the result of its advocacy by Kant. It is indeed a doctrine which emphasises a sharp distinction between our thought and that of the great Greek philosophers to whom all students of Æsthetics turn for guidance and inspiration. They, to be sure, were less concerned than we are with the contrast between the subjective and the objective, their thought being especially fixed upon the contrast between perception and thought, both of which are nowadays commonly placed in the subjective realm. Nevertheless, if we study their works, with the modern subject-object distinction in mind, we see that Plato looked upon Beauty as something quite objective, and that Aristotle in his *Rhetoric* and *Poetics* dealt almost wholly with what we should describe as objective considerations. They thus made coherent the conceptions of the naïve man who even in our day rejects promptly any suggestion that the beauty of the object before him is not in, but rather in his mode of consideration of, the object.

No one, however, who notes carefully the drift of present thought can fail to see that the position for which Kant stands sponsor gains strength from day to day, notwithstanding that the revolt of the common man has been reinforced, as we all know, in connexion with the development of the conception of the Absolute, by a goodly number of metaphysicians, led by men like Schelling, Hegel, and Schopenhauer.

Formidable as this attack has been I have never been convinced that the subjectivist position has been seriously endangered, for it seems to me that the Absolutist defence of objectivism carries with it no explanation of the most commonplace of facts in regard to the varied æsthetic judgments of man, all of which strengthen the subjectivist view.

If beauty is appreciated as the result of the grasp of certain aspects of the objective Absolute, it would appear natural to

find all men appreciating the same beauties; yet you and I do not always find beauty in the same objects. Moreover, some men who are highly sensitive to beauty in connexion with certain arts are utterly incapable of appreciating it in connexion with other arts of equal development: the musician perhaps cares nothing for paintings; the sculptor perhaps nothing for music. But if beauty were a fixed objective thing of which we occasionally catch a glimpse, then if the capacity to gain this glimpse were once given to a man in connexion with attention to one art, it is not easy to see why the capacity to recognise this beauty in connexion with other arts should be lacking. It is surely straining a point if, with Bergmann, we suggest that the difference in men in this regard is due to actual difference in the objects observed, which we mistakenly think to be the same for each of us.

If, following the thought of Lotze, we say that the well-recognised differences of taste in man may be accounted for if we make the assumption that the capacity to grasp the Absolute Idea is subject to development: then we are faced by the fact that certain objects, which in an undeveloped culture, of race or individual, are generally held to be beautiful, lose all æsthetic attribution as the race or individual develops a fuller culture. If the barbarian and the child can grasp the Idea sufficiently to find beauty in glaring contrasts of crude colour and blatant music, how does it happen that the fuller development of culture in races and individual men carries with it a loss of beauty in these crude colours, and in this noisy music; and leads to the discovery of beauty in new fields. One may in fact find the old sources of æsthetic delight yielding actual ugliness, the contradictory opposite of beauty; in this recognising the quality of beauty, and denying its application in the case observed.

If the Lotzian explanation is to be accepted we seem to be compelled to adopt the very strained hypothesis that in an individual who has once developed a capacity to grasp a certain aspect of the Absolute, that capacity may be reduced as the result of a higher cultural development, which if high enough may even lead to his actual denial that the form in question is an aspect of the Absolute. This hypothesis I do not believe any modern Absolutist would maintain.

An accession to the objectivists' ranks rather than a reinforcement of their assault upon the subjectivists, we find in the view presented by E. H. Bullough. He tells us[1] that what he calls "psychical distance" is "a factor in all art".

[1] *British Journal of Psychology*, v., p. 90 ff.

It is always there even when unnoticed; but when it is, it "comes to us as a revelation; such revelations being precisely those of art". "What is, both in appreciation and production, most desirable is the utmost decrease of distance without its disappearance."

This "psychical distance," he holds, is obtained "by separating the object and its appeal from one's own self, by putting it out of gear with practical needs and ends," but retaining a personal relation. It gives syntheses of such opposites as objective and subjective; idealistic and realistic; sensual and spiritual, individualistic and typical.

Beyond the author's acceptance of the objective position above referred to, it seems apparent that he is influenced by the efforts of the objective idealists, especially of Hegel, to subsume opposites under higher syntheses. This last point, however, does not concern us here.

The meaning of the author's phrase "psychical distance" is not obviously clear; but the addition of the qualifying word "psychical" seems to indicate that he refers to no more than what is usually spoken of as the mental process of objectification. If, however, he means more than this then his view is subject to the objections to the Absolutist theory made above.

In his words above quoted he may be taken to refer to art, and not specifically to beauty, which would mean that he follows those who look upon art as something in connexion with which beauty may appear, but which is itself apart from beauty. If, however, he does refer to beauty, as on the whole he seems to do, and identifies it with this "psychical distance"; then it would appear that in holding that both in its appreciation and production what is most desirable is the utmost decrease of connexion with practical needs and ends, but a maintenance of the personal relation, he is really basing his view upon the maintenance of the Kantian notion that beauty always involves disinterestedness; a view that Santayana[1] has once for all shown to be ungrounded.

Turning now to the thought of those who have been more evidently influenced by German metaphysics, we may consider in the beginning a view which harks back to the thought of the author of the first *Philosophy of Art;* for in J. Mark Baldwin's *Theory of Pancalism*[2] we have a result, as its author acknowledges, quite similar to that suggested by Schelling, although reached by a very different mode of approach, and by an original method. His view may be summarised as follows:—

[1] *The Sense of Beauty*, p. 37 ff. [2] *Genetic Theory of Reality.*

In the search for reality the mystical mode of the pre-logical stage gives place to the speculative mode of the logical stage. Neither of these exhausts the real, and each by itself involves but a partial appreciation of it; the mystical concerns itself with the self-experience; the speculative with the "other" of the objective world. "The question is this: Is there any experience in which the self realises itself, not as in opposition to the 'other,' but as in the 'other'?".[1] This synthetic reconciliation our author finds in the æsthetic experience. "In the æsthetic contemplation of an object experience achieves the synthetic and full appreciation of reality";[2] æsthetic contemplation being "a state which may be described as one of feeling".[3]

The difficulties connected with the dependence upon "feeling" are too great to be overlooked, as I have elsewhere argued at length. The word "feeling" means so many, and such different, things that it is impossible to define with clarity a theory expressed in its terms. Nor will anyone who is actively engaged in artistic work agree that our sense of beauty can be limited to the realm of contemplation. If such a view is maintained it would appear that our author's contention involves the notion that we have reality given in only some of, and not in all of, beauty; a position that can surely not be satisfactory to either æsthetician or metaphysician.

With the general metaphysical positions maintained by the author, I can, of course, not attempt to deal; I may, however, note Prof. Urban's remark that "an initial presumption against the æsthetic as the ultimate aspect of reality cannot be denied . . . the fleeting, somewhat aristocratic, and parasitic nature of beauty makes the author's task a difficult one. The æsthetic experience has little of the massive and instinctive element attaching to the common-sense and religious interpretations of the word. It has none of the atavistic lure that draws others to a pre-logical and mystical union with reality. It is wholly lacking in that wilfulness which gives to idealistic and voluntaristic theories their power. Yet it is to forces such as these that conviction must ultimately appeal, and æstheticism makes no such appeals".[4] To this I may add that I fail to find convincing the author's effort to show that our mode of mental functioning in relation to the Beautiful is quite diverse from the modes found in relation to the True and the Good. As A. Lalande has said "The æsthetic norm has rights equal to the logical and moral; but it cannot be accorded the hegemony".[5]

[1] *Op. cit.*, p. 200. [2] *Op. cit.*, p. 231. [3] *Op. cit.*, p. 209.
[4] Wilbur M. Urban, *Journal of Philosophy, Psychology, and Scientific Methods*, xiii., p. 358.
[5] *Cf. The Philosophical Review*, vol. xxv.

We find in our day not a few, and some of them brilliant, writers of works relative to Æsthetics basing the positions they take upon doctrines presented by the talented Italian philosopher Benedetto Croce; although it seems unlikely that they have fully comprehended the subtle and complicated metaphysical system he has propounded, or would be willing to accept many of the points he finds himself forced to maintain if he is to carry his theory to its logical conclusions. His influence is easily explicable, however, when one notes that certain of his doctrines to which we shall presently refer appear on their face to enforce the tenets of Romanticism.

Croce has devised a metaphysical theory in which his Æsthetic plays a significant rôle.[1] "Mind is a reality, and there is no reality which is not mind. . . . This mind which is reality, or this reality which is mind, is an activity the forms of which we may distinguish; and also we may distinguish the order and relation of the forms; but we cannot separate them. . . . Reality is a system. The work of philosophy is to present these forms of activity and show how in their processes they unite to form the concrete world of experience. Two forms of this activity we are accustomed to distinguish—knowing and acting. The first is the understanding, the theoretical activity; the second is the will, the practical activity. They stand to one another in the relation of a definite order. . . . Knowing . . . is an active process, and its activity has two forms; one an activity of intuition, the other an activity of conceptual thinking. The science of the one is æsthetic; of the other, logic. Æsthetic stands to logic as a first to a second degree, for logic is dependent on æsthetic, while æsthetic depends on no other activity. The practical activity is also sub-divided into an economic and an ethic activity. Knowing and acting each with its two sub-divisions yield to us four pure concepts which together exhaust reality. The four pure concepts are beauty, truth, usefulness, goodness."

Croce is himself a literary artist, and he has given us a really beautiful symmetrical schematisation of which the above is a succinct statement. How far this system is satisfactory as a metaphysical theory it is not for me to inquire; the point that interests me is his doctrine that the activity of intuition has Æsthetic as its science, and yields to us beauty as its pure concept.

[1] An interesting résumé of this theory will be found in H. Wildon Carr's *The Philosophy of Benedetto Croce*; from pp. 7 and 8 of which I here quote.

That Croce means to indicate by the word beauty exactly what the common man means to indicate by the word is clearly shown by the many illustrations used in his books. Intuition is for him the primary fundamental activity, and beauty is its pure concept.

I myself fail to see any ground for this claim. That there is a primary fundamental activity is without doubt true; and we may, if we choose, call this intuition. We may also, if we choose, designate the science of this activity of intuition by the term Æsthetic, somewhat after the manner in which Baumgarten applied that term to what he conceived of as the logic of obscure knowledge. But as Baumgarten failed to convince the world of thinkers that beauty was the concept of his Æsthetic, so I think it must be held that Croce has failed to present satisfactory grounds for his claim that his Æsthetic, as he defines it in terms of intuition, has beauty as its concept.

Mr. Carr, in the work above referred to,[1] illustrates Croce's meaning by describing an experience of his own as he walks in a garden of a summer evening, picturing eloquently the beauties of nature borne in upon him. "What I contemplated was beautiful," he says. . . . "If I think of the experience as the simple, single, indivisible reality it was, not as something separable into this, that and the other; there is a quality, or character of that experience which is æsthetic, and if we suppress in thought everything in the experience which is mental we must suppress this æsthetic character."

But suppose Mr. Carr had taken as his illustration the experience of a soldier in the trenches in our late war, the course of his argument would then certainly lead him to say that *ugliness* is the pure concept of intuition.

Croce might refer to his contention as put in the words of Mr. Carr.[2] Each "distinct concept is itself a unity or synthesis of opposites. The concept of beauty is not the concept of some character which exists, or could exist, in pure abstraction from the character which is its opposite, ugliness. Ugliness is an element in the concept of beauty. The two characters, the beautiful and its opposite the ugly, unmeaning and unreal and undefinable in abstraction from one another, exist only in the synthesis of the distinct concept beauty."

But if we imagine ourselves gaining the experience of the soldier in the trenches is it not equally possible to reverse the terms of the synthesis, and to say that 'beauty is an element in the concept of ugliness; the two characters, the ugly and

[1] *Op. cit.*, p. 9. [2] *Op. cit.*, p. 141 f.

its opposite the beautiful, unmeaning and unreal and undefinable in abstraction from one another, existing only in the synthesis of the distinct concept ugliness'? And in that case are we not as fully warranted in holding that ugliness is the pure concept of intuition, as Croce is in holding that beauty is this pure concept of intuition? It seems to me that one position is as fully unwarranted as the other.

Croce also maintains with insistence a doctrine that is the one referred to above as making a special appeal to modern Romanticists. He holds that intuition necessarily involves expression,[1] pure intuition and pure expression being one and the same thing.[2] The æsthetic is not feeling;[3] by which term he means a special non-cognitive activity possessing two poles, positive and negative, pleasure and pain.[4] Beauty is successful expression; or better, expression and nothing more; because expression, when not successful, is not expression.[5] For this reason beauty does not possess degrees; ugliness does.[6] The judicial activity, which criticises and recognises the beautiful, is identical with that which produces it.[7] And finally, inasmuch as beauty is successful expression we are led to the conclusion that the Linguistic and the Æsthetic are identical.[8]

Concerning this view I may remark in the first place that it gives us no guide to the nature of beauty. Beauty is described as successful expression. Now all of man's activities are expressive in some sense, while few of them result in yielding the experience of beauty; in other words some expression is, and some is not, successful, and we naturally ask wherein this success consists. But we are told that expression when not successful is not expression at all. Beauty and expression are thus held to be identical, and we find that our author uses the latter term as a synonym of beauty, and not in any way as explanatory of its meaning.

He tells us, as we have noted that the individual activity which recognises the beautiful is identical with that which produces it. Now it is of course quite possible, and quite legitimate, to consider as a working hypothesis the view that beauty exists only in the observer's own artistic expression, so far as he evinces any, and to try the hypothesis out in the court of experience. If we do so we find that one of the first results is that it compels us to hold that beauty is in all cases the creation of the observer, and therefore that there is no

[1] Confer *Æsthetic*, Benedetto Croce, translated by Douglas Ainslee, p. 13.
[2] *Op. cit.*, p. 391. [3] *Op. cit.*, p. 123. [4] *Op. cit.*, p. 122.
[5] *Op. cit.*, p. 129. [6] *Op. cit.*, p. 130. [7] *Op. cit.*, p. 197. [8] P. 234.

such thing as the beauty of Nature. This result Croce boldly accepts contending that what we think of as beauty in Nature is in reality put there by our own imaginative activity. It is to be noted that Mr. Carritt, to whose critical appreciation of Croce we refer below, dissents from this final result; but in so doing, he, in my view, abandons the whole doctrine which Croce sets out to establish.

It may be possible for some men, constituted as Croce apparently is, to find this mode of beauty in the imagination of themselves as its creators through their own expression; but I am confident that the average man finds the beauty of Nature quite apart from such egoistic imaginings, and solely in the impressions given. In fact there is no little evidence in Croce's own writing[1] that he himself experiences such beauty of impression, pure and simple.

It may be noted, moreover, that the hypothesis when carried to its legitimate conclusions leads to results which will appear to the average man highly paradoxical. Thus we are asked to agree that "the beautiful does not possess degrees," "there is no conceiving a more beautiful";[2] that "expression is truth";[3] and that "every act of expressive activity" (*e.g.*, that of the famished glutton, H.R.M.) which is so really, will be recognised as beautiful.[4]

On the whole I find no reason to agree that Croce's Æsthetic will in the future be held to have been an advance in the progress of thought on this subject.

We thus see clearly how it happens that Croce's contentions appeal to our modern Romanticist, of whose positions we may well remind ourselves. The fundamental difficulty with their view lies in its failure to distinguish between the quite diverse attitudes of the artist and of the observer, and in the attempt to interpret the latter in terms of the former. This notion is usually masked by the Romanticist, but in our author's work it is frankly accepted, and as frankly carried to its legitimate conclusions, resulting, in my view, in a complete *reductio ad absurdum*. In its crudest form it claims, as has been suggested by some thorough-going romanticists, that the beauty we find in Nature, in a landscape for instance, is due to reminiscences of artistic representations of landscape. This extreme view may however be passed by with little comment, for it very evidently cannot apply to all the beauties of Nature; for instance to the beauty that is found in some quite unique gem, or in the brilliant breast of some rare tropical bird that the observer has never before seen.

[1] *E.g.*, bottom of p. 131. [2] P. 130. [3] P. 167. [4] P. 202.

Somewhat closely allied with this notion is the "*Einfühlung*" theory of Lipps according to which beauty is found in natural objects so far as the observer imagines himself as within these objects; and results from his thinking these objects to be what the observer himself would be could he express what he appreciates are the functions of these objects. Without any question for some small class of highly sophisticated men the beauty of natural objects is enhanced by this imaginative process; but it seems clear to me that we fail altogether to find in such a theory the explanation of the æsthetic experience of the unsophisticated man, or of certain sources of beauty that are very generally recognised. It is impossible, for instance, to follow Lipps if we attempt thus to explain the beauty the human male finds in the contemplation of the breasts of the female, the functioning of which he surely cannot appreciate.

A more subtle statement of this conception is attempted by Mr. E. F. Carritt, who may without offence be called a disciple of Croce, but whose careful critical attitude gives his thought independent value. He puts it thus:[1] "It is not the written or spoken poem nor the perceived atmospheric conditions which must strictly be called beautiful, but only a particular way in which at a given moment any individual expresses himself in them". And again,[2] "A mountain, a poem, a song is beautiful to the man whose feelings are expressed in it; and it makes no difference whether we say that it expresses them to him or he expresses them in it".

It seems to me that it makes all the difference in the world which we say. If we fail to make, and keep clear, the distinction we fall into the most serious of difficulties. In the case of Mr. Carritt, it leads to vagueness and mysticism. It helps us little to conclude, as he does,[3] that all beauty is the expression of what may be generally called emotion, and that all such expression is beautiful, unless we define the term emotion; and if we do so intelligently we surely find that it is not true that all expression of emotion is beautiful. Nor, if we ask what expression means, does it help us to be told that "it is a primary spiritual activity" which "can no more be explained than can thinking itself". In fact our author in the final sentence of his interesting volume tells us that he does not pretend to have reached a solution satisfactory even to himself.

[1] *The Theory of Beauty*, p. 298. [2] *Op. cit.*, p. 182.
[3] *Op. cit.*, p. 296.

We may now turn finally to the consideration of a theory which appears as a development of the metaphysic of Hegel, but which at the same time is markedly influenced by the tenets of the Romanticists which appear dominant in Croce's work; and which shows the same failure to distinguish the attitude of the creator of beauty from that of the observer.

More than two decades have passed since Bernard Bosanquet published his valuable *History of Æsthetic* in which he gave fairly clear indications of his own views, but only to one who took the trouble to read between the lines. These personal views have, however, been presented since then in a series of lectures,[1] very briefly indeed, but in clearer form.

Did not one know of the Hegelian influence evidenced in other writings of this author he would feel it throughout the present work. It is especially noticeable in his treatment[2] of the "Æsthetically excellent," or real beauty, as inclusive of what we usually call the beautiful and also of its contradictory the ugly.

The influence, however, which from our standpoint is most significant in the development of his thought is, however, that arising from the prevailing recrudescence of Romanticism which lays stress upon the importance of the creativeness of the artist, to the oversight of other elements of equal importance. Its catch-word is "Expression for expression's sake"; and that, with a certain change, is employed by our author.

Apparently led by this influence, Dr. Bosanquet, like Croce, fails to distinguish between the attitude of the creator of a work of beauty, and that of the uncritical or critical observer. He tells us[3] that "the spectator's attitude" is "merely a faint analogue of the creative rapture of the artist," and[4] that "the whole world of beauty . . . is the individual operation of a single impulse, the same in spectator and creative artist".

This position is, in my view, as I have already stated, distinctly contradicted, if in no other manner, by our appreciation of much of the beauty fitted in the observation of Nature. I cannot discover in the beauty I find in a glorious sunset, or in the delicate poppies on my table, or in the song of the bird warbling in the trees without, even the very faintest "analogue of the creative rapture of the artist," with which I may perhaps claim to be in some measure acquainted.

[1] *Three Lectures on Æsthetic.* Confer my Review in the New York *Nation*, July 29th, 1915.

[2] *Op. cit.*, p. 98 ff. [3] *Op. cit.*, p. 35. [4] *Op. cit.*, p. 111.

The artist is led by impulse, and in his creative moments is careless of what Bosanquet calls the "world of beauty"; or of any aim, other than the expression in his chosen medium of the conception he has in mind. In this his attitude is that of the inventor, the discoverer; and he gains, as all inventors and discoverers do, the joy which creativeness always carries with it. When he gains the appreciation of the "world of beauty" in which his work is to take its place, as he must from time to time in intervals between his creative moments, he at once takes a new position, namely that of the observer of beauty; and his mental attitude changes wholly. He is not then creative, but perceptive; not concerned with the joy of accomplishment, but with the complex impression that yields beauty. Without doubt in many cases where the impression is given by Art rather than Nature the studious connoisseur finds in this complex impression elements correlated with the sympathetic comprehension of the artist's attitude; but it seems clear that "the world of beauty" of the great body of those who are thrilled by artistic products cannot be appreciably involved with this "Empathy"; and entirely impossible to maintain that the beauty discovered in Nature can be expressed in terms of this "creative rapture of the artist".

This influence of modern Romanticism must again be borne in mind when we consider our author's emphasis of expression; when, for instance, we read[1] that the æsthetic attitude may fairly be described as "feeling expressed for expression's sake". Evidently the term expression may, in this connexion, have the two distinct references of which we have spoken, which really involve two distinct meanings.

It may refer to the object that yields the impression of beauty; which object is thus supposed to bring into view, or express, some hidden significance that is not given in mere appearance. Thus Mr. Bosanquet tells us[2] that "Nature has in it a life and divinity which it is attempting to reveal". Taken thus, expression can only appeal to one who assumes the attitude of the observer.

Or the term expression may refer to the creative effort of the artist who attempts to interpret, or "express," some conception of his own that is hidden from the insight of the spectator to whom his artistic product appeals.

One who fails to discriminate between these two quite diverse attitudes of mind can thus scarcely avoid being led to obscurity of thought when he defines the æsthetic attitude as

[1] *Op. cit.*, p. 36. [2] *Op. cit.*, p. 55.

"feeling expressed for expression's sake". Dr. Bosanquet indeed gives us[1] an alternative definition of this æsthetic attitude "so far as enjoyable" as "the pleasant embodiment in an appearance presented to imagination or imaginative perception"; and here he apparently has in mind the attitude of the observer who finds some special meaning expressed in the observed object. But that he does not limit his conception to this expression in the object is made clear, for instance, where he tells us[2] that "imaginative expression creates the feeling in creating its embodiment," in which case the expression must inhere in the creative activity of the one who produces the embodiment.

In taking "feeling expressed for expression's sake" as a definition of the æsthetic attitude, it is, of course, important to comprehend the meaning to be attached to the word "feeling," which word, as we have noted above, is very loosely used in common speech, so much so indeed that careful analysts hesitate to employ it at all. Croce, for instance, whose general views on Æsthetic are in many respects closely allied with those of Dr. Bosanquet, holds the term to be utterly unintelligible. Acknowledging this difficulty, Dr. Bosanquet, therefore, attempts to define the word, telling us[3] that he means by it "the concernment of the whole 'body-and-mind'"; and adding[4] "In it mind is all body, and body all mind". Here there is surely a lamentable lack of clarity where clarity is most important.

But assuming the meaning of "feeling" to be grasped, it seems clear that, if Dr. Bosanquet's definition is to be held to be satisfactory, "feeling expressed for expression's sake" must always be æsthetic. This is certainly not true if æsthetic is to be identified with the appreciation of what our author calls "the world of beauty"; for, on the one hand, this formula applies, not only to the product of the great artist which arouses our enthusiasm, but also to that of the tyro who fails altogether in his effort, even in his own estimation; and on the other hand it does not seem possible to make it applicable to the beauty of natural objects without changing altogether the reference of the term expression.

We are bound, therefore, it seems to me, to hold that our author, and those who approach his mode of thought, are not dealing with Æsthetic as the study of what is ordinarily called the beautiful, but rather with a special concept for

[1] *Op. cit.*, p. 36. [2] *Op. cit.*, p. 34. [3] *Op. cit.*, p. v. [4] *Op. cit.*, p. 7.

which no more can be claimed than that it finds its most interesting exemplification in the quality which attracts the lover of Nature and of Fine Art, and which is known to the average man as beauty.

That Dr. Bosanquet is dealing with a very special concept of this kind is indeed very evident to one who follows the course of thought of the modern idealists since Kant. Yet this everyday quality of beauty was surely referred to in the treatment of Æsthetic by Baumgarten and Kant; and in fact we must hold that Dr. Bosanquet himself has this quality in mind if we judge him, apart from his metaphysical theory, by the language of the descriptive and illustrative passages of his *History*.

In any event, it is clear that it is this quality of beauty to which the average cultivated man refers when he uses the word æsthetic, and he is fully justified therefore in asking how far the later development of metaphysic has aided the spectator in the appreciation of beauty, the critic in the guidance of his judgments, and the artist in his effort to attain his goal. That it cannot hope to help the artist, Dr. Bosanquet himself acknowledges.[1] That it has broadened the appreciation of beauty so far as it has led to the introspective studies of men like Schiller and Goethe cannot be questioned; but it must be looked upon as having been the stimulus to such introspective studies rather than their effective basis. That it has brought into prominence indirectly certain valuable principles of criticism must also be granted; but this because it has involved the concentration of thought upon the quality of beauty as given in experience, rather than because of the appreciation of any necessary implication of the tenets presented for consideration.

The serious student of æsthetics who takes such a view as we have taken in this and the preceding chapters cannot, it seems to me, fail to find his thought turned from metaphysic to the psychological study of the experience involved in the appreciation of beauty. He must feel that in such psychological study alone he may hope to gain the fundamental grounds for a just appreciation of beauty in all its fullness, for a well-balanced critical judgment, and for a helpful view of the relation of the artist to his work. He must acknowledge a great debt to the metaphysical studies of the Greek masters; and perhaps as great a debt to those of the modern idealistic philosophers and to the talented writers influenced

[1] *Op. cit.*, p. 2.

by them, in that they have given him data of inestimable value in his work of investigation. But he must be convinced also that the metaphysical problems which are raised by the philosopher can never be solved until he bases his thought upon firm psychological grounds.

V.—DISCUSSION.

THE BASIS OF BOSANQUET'S LOGIC.

I.

PERHAPS I may be permitted to make a belated reply to Prof. Bosanquet's remarks in MIND, April, 1919, on my article in MIND, October, 1918. I feel that my best plan will be to state as fully as I can the ideas which led up to my view.

(i) "The sense world," says Kant, "is either a nature or no object of experience."

While I did not accept his opposition between matter and form, I saw that in some way the mind is carried to a "nature" through conditions which it does not see completely fulfilled, but which it endeavours to see fulfilled.

(ii) But on the other side I saw that the so-called "laws of thought" are laws of things; and I decided that Formal Logic was a science of objects—the science dealing with the elementary and universal characters of things. And by "Formal Logic" I meant, not the traditional Logic, but the Formal Logic we shall one day have, when we are clearer of the limitations which now beset traditional Formal Logic.

(iii.) I never regarded the syllogism as the sole form of deductive thinking. When Mr. B. Russell introduced us to the Logic of classes and relations, I thought that this was an enormous generalisation of formal processes. But I did not accept the view that these inferences were or could be linear in Prof. Bosanquet's sense. I felt that the premisses and conclusion hung together in a way which was not brought out in the formal steps. For I wanted an account of inference which should apply to it in the making, and not only when made; and when Mr. Russell admitted that his premisses in Mathematics were chosen because of the conclusions, I welcomed the admission, as possibly leading him to a view of inference such as I was seeking for.

(iv) I saw that in any actual inferences the essential steps depend on insight into the interrelations between part and part in a systematic field. I did not regard the "proof" of a proposition as set forth in linear inference as an account of "inference," but only as an account of the systematic interrelations between the parts of a systematic field. But, when the inference was stated linearly, it did seem to me that whoever granted the premisses was

compelled to grant the conclusions, and that *in that sense*, the conclusion depended on the premisses. But I could not agree that the premisses depended on the conclusions in the same sense. Premisses and conclusions alike seemed to explicate the whole system, and hence the premisses and conclusions "depended on" the system in *that* sense—a sense different from the sense in which the conclusion "depended on" the premisses. Indeed the phrase "depended on" was a phrase I preferred not to use. A conclusion "follows from" its premisses; "insight" into a system grows with "knowledge" of connexions between premisses and conclusions and conversely; and the ultimate justification of the relations between premisses and conclusions, and of their bearings on the nature of the system, seemed to lie in the nature of the system itself.

(v) I was still, however, left with the difficulty mentioned in (i) and (ii) above. When I read Bergson's *Évolution Créatrice*, and considered his criticisms of intellect, and his reliance on intuition, I put them alongside of what I had derived from Kant, and from those modern philosophers (chiefly French) who emphasise the fact that the mind makes certain demands of experience, and refuses to understand unless those demands are satisfied. The French philosophers (*e.g.* Poincaré) regarded these "constructions" as arbitrary and external to the facts; but while I recognised the need for the constructive activity of the mind, I could not agree that this activity was external to the facts. I thought it must somehow be anticipatory of the fuller experience. And that helped me to decide, in reference to Bergson, that he was right in putting intuition above formal inference, but wrong in his reason for doing so. The human mind, I thought, must make certain demands; but it does not know fully what these demands are. It comes gradually to consciousness of these demands, by the process of formulating them explicitly and formally, endeavouring to insist on these formally stated demands being satisfied, and being compelled to modify them in consequence. It was in this way that I read the history of the principles of Logic: "A is A" being first formulated in such a way as to make the whole universe unreal, and then substituted by "S is P," formulated so as to allow of variety, but still not of change. Thus "Understanding" (at any stage of the history of philosophy) would represent the progress the mind has made in formulating its demands to itself. "Intuition" would represent the whole mind reading its world in the light of all the demands the whole mind makes, these demands being not yet explicitly formulated.

(vi) But this was only half the problem. For the so-called "laws of logic," the mind's demands so far as explicitly formulated, must also be, I felt, laws of things. Accordingly, I endeavoured to work at the question from this side. And here I studied the Logics of Mr. Bradley and Prof. Bosanquet.

My problem was the problem of the relation between the knowledge of reality that takes the form of explicitly systematised

sciences, and the general knowledge of reality that makes up what we call our ordinary experience. In reading Prof. Bosanquet, I was enabled to formulate the view that ordinary experience of reality can only contradict scientific knowledge on the basis of scientific knowledge itself; that *e.g.* the perception that a particular fact is in contradiction with a scientific generalisation is not sufficient until the particular fact is shown to involve a new scientific generalisation. Thus for Prof. Bosanquet's statement that every generalisation challenges support from the whole of reality, I substituted the proposition that every generalisation insists on being borne out by the whole of reality. I did not of course mean that every generalisation must necessarily be true; but what I meant was that it is only on the basis of one generalisation being seen to be superior to another that the latter could be set aside.

To the view then that Reality is the ultimate subject of every judgment, I opposed the view that since the whole of our explicitly formulated knowledge depended on the abstraction from reality, and distinct consideration, of some special field, and that, since our remaining knowledge of reality must depend for its progress to explicitness on the knowledge already made explicit and not *vice versa*, it must follow that the ultimate justification for any explicit knowledge must be the whole field of that knowledge as an articulated system and not the general knowledge of reality which makes up our experience. If it is not borne out by the rest of our experience, of two things one: we must either reject it, or reject such of our experience as does not square with it. But since it is only on the basis of a further articulation of the already articulated narrower field that we can decide which of these alternatives we are to adopt, it followed, I thought, that *the whole process must pivot round the articulated field, and not round our experience of reality taken as a whole*. The articulated field, I thought, enabled us to get knowledge in virtue of its content and not in virtue of its reality; and thus the mind could construct a world (indeed, in the way of abstraction *must* construct a world) other than the real world, derive knowledge therefrom, and insist that if it was true in the constructed world, it must be true in the real world, so long as the same characters were to be found in the real world. Hence I was led into radical opposition to Prof. Bosanquet on the question of the ultimate basis of judgment.

(vii) "But then all judgment rests on supposal. Now there are some things you *must* include in any supposition, and these you cannot call supposals: all the 'formal' properties of things—non-contradiction, identity, distinctness, etc. These things really involve the inclusion of reality in your supposal."

To this I was unable to assent, although I could not solve the problem satisfactorily to myself. The objection had been felt by me all along, in connexion with my difficulty of seeing how the mind imposes conditions on experience and how at the same time these conditions must turn out to be laws of things.

I was unable to assent, for I could not see how these "formal"

characters of things could be in any way different from any other characters which the mind discovers in its exploration of any of its abstractly constructed systems. If, as I concluded in my reading of Bergson, the "formal characters" of things are seen to change in significance as philosophy progresses, this means that Formal Logic (in the sense suggested above—a science which is slowly developing and indeed very much in its infancy) is like any other science, and depends on the same kind of process.

Thus my attitude toward supposal was not exactly what Prof. Bosanquet supposes it to be. My reason for suggesting a posited system to be enough was, not that I thought that you could get away from reality by including everything in your supposal, but that I thought that posited systems are at the basis of the whole of our explicated knowledge of reality, and that the "reality" of any element in knowledge seemed to be irrelevant to the consideration of its content. Distinction between content and reality on the one hand, and the growth of knowledge of reality conceived as an extension and expansion of systematic knowledge of posited systems on the other, formed my starting-point. The relation between the general awareness of reality that we have in ordinary experience and the systems we posit, I conceived to be explicable in terms of the activity of the mind in taking up what is presented to it, abstracting from it a simplified system, understanding it wrongly, and being corrected by its own attempts to widen its simplified system; the process ending only when some simplified system is explored in its fundamental groundwork, as Prof. Stout suggested in his paper on Error (in *Studies in Humanism*).

II.

I should like to plead not guilty to some misinterpretations of his view which Prof. Bosanquet finds in my paper.

(1) I did not think that for him the important question is "whether the antecedent exists in fact" (MIND, April, 1919, p. 203). As this is a matter of some importance for my argument, I should like to dwell on it a little.

On p. 204 Prof. Bosanquet quotes two sentences from my paper. "On his premisses," I wrote, "if the judgment is to be genuine the new matter must be real." "The result, then, of Bosanquet's theory is that only the real, etc." What I meant was that these things seemed to me to follow as a logical consequence from his view, not that he actually held them—though I thought that he did hold them in the last resort, from the standpoint of absolute truth. I had endeavoured to make it clear in my exposition (Oct., 1918, pp. 440-444) that he did not hold them in relation to ordinary reasoning. The criticism I was trying to make was (*a*) that if the content need not exist, then the basis of the judgment is something less than reality; and (*b*) that the whole account of the relative parts played by "what must exist" on the one hand, and the

supposed content on the other, renders it impossible for Prof. Bosanquet *on his premisses* to accept a hypothetical judgment whose antecedent did not exist in fact. I was, in short, endeavouring to bring home a charge of inconsistency.

Thus to the paragraph on p. 209: "And hence, Mr. Russell goes on, etc." I should reply that it is just there that I was endeavouring to involve Prof. Bosanquet in a difficulty. It was not that I supposed him to hold that the new matter must be real. It was that I did not see how he could avoid this, and still hold that the ultimate subject of the judgment was reality.

(2) Prof. Bosanquet objects to my statement that on his view "the exploration of a relational system must take the system in some one particular setting" (p. 209). May I explain that I did not mean that on his view "you can establish relational systems pure and unattached, etc."? The statement complained of was inexact, for the sake of brevity, but I thought that it would be read in connexion with the more careful statement about universals on pp. 433-434; and my criticism which followed on p. 438 was devoted to showing that if this view of universals is to be taken seriously, predication of anything less than the whole of reality *of* the whole of reality, becomes impossible. When I spoke of a "concrete whole"—"characteristic structure" (p. 434)—the "concrete detail" to which I was referring was something other than the "indispensable basis" of which Prof. Bosanquet speaks on p. 209. I was thinking, *e.g.* of the way in which "breathing" in his example is modified by the question of whether it is a man or a horse whose breathing is in question (where he is not willing to push the doctrine to its ultimate consequences), or of the way in which the truths of Arithmetic are modified when you relate them to Economics. And thinking of the general view throughout the Logic that nothing, in the end, is really irrelevant, it seemed to me that Prof. Bosanquet's doctrine of universals ought to be either quite strenuously adhered to, or given up. But by "indispensable basis" of a relational system, Prof. Bosanquet on p. 209 means something different. He means "the reality which survives in it, including at least 'the laws of thought,' *i.e.* the ultimate factual characters of things" (p. 209); which are described (pp. 207-208) as "elements of the real universe" which we recognise and postulate, as "elements of reality which . . . are implied in the function of judgment . . . "; and (206) as "at the very least what I have called the life of reality, etc.," "the 'laws of thought,' *i.e.* the coherent life of the universe, and at least the most formal properties of things, identity, and distinctness and the rest . . . ".

My whole difficulty, in endeavouring to understand Prof. Bosanquet rightly, was in seeing how he could rest in this, and not go on to include the whole of reality in all its concrete detail in his "indispensable basis".

This difficulty Prof. Bosanquet does not feel in his own view; but it was this which made me endeavour on pp. 436-437 to formulate, as explicitly as I could—though with great misgivings, for I

did not manage to extract it with perfect certainty—what he meant by "Reality".

(3) Perhaps I may bring my disagreement to a sharp point by two quotations from him.

"Every judgment, just because, after its conditions are made explicit, it is absolute and universal in its challenge to reality, is conditional on the unknown. It asserts itself to be unconditional, but obviously, for this very reason, its truth depends on the absence of hidden obstructions in the universe of unknown reality" (MIND, *loc., cit.* p. 209; and *Implication and Linear Inference*, p. 174). I agree that "every judgment is absolute and universal in its challenge to reality". But I should insist that, if it is to be set aside, it must be set aside by judgments of the same type as itself—*i.e.* judgments depending on partial systems. I should deny that ". . . every inference involves a judgment based on the whole of reality, though referring only to a partial system which need not even be actual" (*Implication*, p. 4). I should put it just the other way. The judgment, I should say, is always and inevitably based on such a partial system, though referring to the whole of reality.

L. J. RUSSELL.

VI.—CRITICAL NOTICES.

God and Personality. Pp. 281. *Divine Personality and Human Life.* Pp. 291. The First and Second Courses of Gifford Lectures delivered in the University of Aberdeen in the years 1918-19. By CLEMENT C. J. WEBB. London: Allen & Unwin. New York: The Macmillan Co.

GIFFORD lecturers have often strayed far from the lines of thought proposed by the late Lord Gifford, and have said little or nothing about Natural Theology. This is not true of Mr. Webb, for his lectures are quite in harmony with the purpose of the testator. In these volumes a great and difficult subject is handled with judgment and conspicuous ability. The writer is well aware of the perplexities which attach to his theme; and while he is always ready to give a reason for his faith, the note of confident dogmatism is absent from his discussions. Mr. Webb's method of treatment may not always seem direct: he has a predilection for the historic method, and often develops his own views by a criticism of Plato or Kant, Bradley or Bosanquet. But in most cases the reader will find the lecturer is trying to follow the lead of the argument, and is on the way to conclusions more or less definite. It may be added that he is better qualified than most writers for dealing with this problem, inasmuch as he adds a sound knowledge of theology to his philosophical equipment. In proof of this we may refer to the careful and illuminating discussion of the terms *οὐσία*, *ὑπόστασις*, *πρόσωπον*, as well as their Latin equivalents *substantia* and *persona*.

In his first volume Mr. Webb traces the history of the term Personality, discusses its relation to Individuality and Rationality, and then goes on to consider the problems of Creation and of Sin: he concludes with chapters on the relation of Religion to Philosophy and on Divine Personality. The second volume examines the relation of Divine Personality to the Economic, Scientific, and the Aesthetic, the Moral, Political, and Religious Life, and finally deals with the Value and the Destiny of the individual person. In the space at my disposal I must confine myself to one or two points in the Lectures which appear to be of vital importance.

An outstanding and praiseworthy characteristic of Mr. Webb's work is the stress which he lays on the religious experience; and he is always concerned to do justice to what is implied in it. If there are figurative elements in the theological interpretation of that experience, it by no means follows that the experience does not

contain substantial truth. The view of Croce, who will not hear of a transcendent God, and who, merging religion in philosophy, denies that religion is an independent form of experience at all, is emphatically rejected. For it really reduces religion, not merely to a *Vorstellung*, but to an illusion. Nor is the theory of Mr. Bradley found satisfactory; for though it takes the religious consciousness as true so far as it goes, it denies that it is ultimately true. The God of religion on this view is not the Absolute but an appearance within the Absolute, and so in the end not perfectly real. Against this it is urged that the object of the religious consciousness must have full reality. Theories which, refusing to identify God with the Absolute, make Him finite, fail, because to abandon the identification of God with the Absolute is to abandon the quest which is religion (I., 138). Mr. Webb puts the point still more strongly when he says: "The statement that God is not the Absolute, must, I am sure, make nonsense of religion" (I., 152).

If God is the Absolute, can we ascribe personality to Him? and if so, in what sense? That an impersonal Absolute is not the God that religion demands is clear to our author; and he cannot endorse the view of Bosanquet that the Absolute, though individual, is not personal, for this would reduce the religious experience to something illusory. On the other hand to carry over into the Absolute all the implications of human personality would strain analogy to the breaking-point. Mr. Webb's contention is briefly this. What is individual is not fictitious: it has a unique place in the system of reality, and is at one and the same time distinguished from and related to other individuals. This twofold relation is most conspicuously seen in persons, the personal life being mediated by the elements of the social system in which it develops. Mr. Webb naturally finds it necessary to minimise the exclusive element in personality, and he does so by laying stress on the rational or common element. The personal principle of unity in experience, it is argued, is not distinct from the rational. The inference, I take it, is, that the personal life, though unique, is not a hard and fast unity, but may enter as an element into a larger life. The difficulty here is that the distinctive aspect of personality does not get its due. Rationality is necessary to a personal life, but the unique self-feeling and its expression in interest and purpose are just as necessary and make possible the activity of reason as personal. If so, one person cannot be merged in another without ceasing to exist as a personal being. In fairness, however, we must admit that Mr. Webb is very anxious to do justice to the moral and religious implications of the finite self. Like Prof. Pringle-Pattison he protests against the reduction of the self to an appearance, and refuses to allow that personal lives have only an adjectival existence in the Absolute. For this would falsify the religious experience. My difficulty is to understand how Mr. Webb, in harmony with his philosophical premises, can justify the reality of individual selves. Apparently he holds that evolution is in some sense creative; but his chapter on the Problem of Creation is neither very relevant to

the main issue nor very convincing. We are told that man's distinction from God and affinity to Him are expressed by the ideas of creation and generation, and the two ideas are somehow combined in the doctrine of a mediator. Now if the doctrine of creation be frankly accepted, we can understand how finite spirits have a reality of their own, though a dependent reality. And we may agree with Prof. Ward that, if the idea of creation will carry us further than any other conception to a satisfactory view of the universe, then the conception is justified. The trouble with Mr. Webb's position is, how he is to reconcile the assertion that human spirits are other than God with the view that they are also integral elements in the life of God as the Absolute. And I cannot find that he does this. It is in dealing with the problem of moral evil or sin that the need of differentiating human persons from God is most urgent, if God is, as the writer decidedly holds, a moral Personality. But in his chapter on Sin Mr. Webb does not go to the heart of the matter. He says truly that sin is not to be identified with the consciousness of incompleteness and finitude, and equally justified is his contention that the idea of God as an authoritative moral Personality over against the sinner is more in harmony with the consciousness of sin than any other conception. Nor would he, I believe, acquiesce in the statement that the Absolute or God is realised impartially in the sinner as well as the saint. Yet if a moral God is the Absolute, sin cannot be that which 'ought not to be' but must somehow have its legitimate place in the systematic whole. And, if I understand Mr. Webb rightly, he comes back in the end to the view that sin "mediates an ultimate good higher than without it could have been attained" (I., 195). It is not easy to see that he could come to any other conclusion on his speculative presuppositions, yet the result, it seems to me, is not in harmony with the testimony of the religious consciousness.

Why does Mr. Webb try to vindicate the conception of God as both the Absolute and a Personality? There are two main influences which go to determine his philosophy of religion. These interests are respectively religious and speculative. The sympathetic stress laid on religious experience has already been noted as well as the desire to do justice to it. The religious experience, we are told, will save us from being overcome by dialectical difficulties when we attribute personality to the Supreme Reality. Now a personal relation of subject to object lies at the heart of religious experience: it is a communion of persons, and there must be present in the Ultimate Reality that which sustains and justifies this relation. Mr. Webb does not try, as Lotze for instance has done, to offer a philosophical defence of the personality of God: his main contention is that the conception is necessary for the vindication of the religious consciousness. We may agree with him that the object of religious faith must be real and personal, and still decline to identify it with the philosophic Absolute. Mr. Webb, however, thinks religious experience requires this identification: a God less than the Absolute falsifies religion, and spiritual experience finds

no incompatability between Divine Personality and Divine immanence. God transcends our experience for He is not exhausted by it, but He is immanent in our spiritual consciousness, and is never regarded as a purely separate and exclusive personality. As experienced God is distinct from us, and yet our experience is somehow included as a factor in the Divine Life.

The word 'immanence,' I venture to think, bids fair to become one of the *idola* of the philosophic market-place, and one wishes that writers would sometimes explain what precisely they mean by it. It may bear the meaning that man's religious experience is only his own from a narrow point of view: from a more complete point of view it is part of the Divine experience. I am not sure that Mr. Webb would say this, but if Divine Personality is all-inclusive ought he not to say it? I cannot believe that the normal religious consciousness testifies to a merging of the human in the Divine. Sayings of mystics like Eckhart and others do point in this direction, but they do not stand for what is typical in religion. Communion is impossible without a real distinction which persists; and I do not see that spiritual experience implies more than a presence of God to man and an operation of the Divine Spirit on man. Nor is it possible to preserve the reality of the religious relation by insisting that the Divine experience transcends the human in the sense of never being exhausted by it; for my experience cannot fall within the Divine without ceasing in the end to be mine.

I cannot help suspecting that Mr. Webb's philosophical creed has affected his interpretation of the religious consciousness. His resolute attempt to construe the God of religion as the Absolute seems best explained by the speculative heritage which he shares with some writers that he criticises. He is very far from slavishly following the Hegelian tradition, but in this matter he has not emancipated himself from its influence: the result is seen in that tendency to over-unification (*τὸ λίαν ἑνοῦν*) which Aristotle criticised in Plato. It is perfectly true that in religion God is taken to be the Ultimate Reality. But every religious interest is conserved, and no religious instinct is violated, if we say, not that God is all that is real, but that He is the active Ground of the universe, the Supreme Spirit who is only limited in so far as He has limited Himself. Hence when Mr. Webb says that "a theological account of the religious experience" cannot stop short of conceiving this personal intercourse of man and God as falling within the divine life (I., 273), one cannot resist the conclusion that the religious experience is being strained to meet the exigencies of a philosophical scheme. One may sympathise much more with Mr. Webb's conclusions than with those of Messrs. Bradley and Bosanquet, and yet believe that the latter are more true to the philosophical principles which are common to all three. It is a testimony to his insight that Mr. Webb recognises that, in a religious interest, the Personality of God cannot be abandoned. To describe the communion of man with God some supplementation of the mutual

intercourse of human beings may be necessary, he remarks, but this supplementation must not be a reduction (II., 194-195). We welcome the repeated emphasis on the personality of man and God, and only wonder how it is to be reconciled with the theory that God and the Absolute are identical.

I must pass over the larger part of the second volume to say a few words on the final chapters which deal with the Value and Destiny of the Individual.

In treating of Naturalism and the Value of the Individual Person, Mr. Webb makes some interesting and valuable remarks on the so-called dissociation of personality. As he points out, the phenomenon is not limited to pathological cases, but exists in a minor degree in normal experience. Even in the extreme instances of multiple personality he rightly insists that the facts are only intelligible in the light of a fundamental personal unity. When he comes to consider the relation of Absolute Idealism to personality Mr. Webb will be found reiterating his belief in the reality of individual selves. And he asks whether Mr. Bradley's admission of the inexplicability of 'finite centres' is not a reason for doubting his reduction of them to appearance. To this he adds some relevant criticism of those who argue from the principle of self-sacrifice —the losing of one's life to save it—to a conclusion adverse to the reality of personality.

The chapter on the Destiny of the Individual is far from being dogmatic, and the writer confesses he has experienced the feeling reflected in the "present drift of opinion away from the old emphasis on personal immortality" (II., 256). Still he does not adopt the non-committal attitude of Mr. Bradley on the question of a future life—"after all it is possible". For Mr. Webb finds a justification for the belief in the nature of God as personal and His relation to finite spirits. If, he contends, we are conscious of a religious value in our unique individuality, we shall not readily be content to suppose this individuality is not secure in God. It seems to me the lecturer is right in resting the hope of immortality in faith in the Divine character, in the personal love, as he puts it, which is revealed in the religious experience. In putting forward this argument probably Mr. Webb supposes he is not departing from his intention of dealing with immortality only in so far as it can "be inferred from a certain theory of the nature or structure of reality" (II., 256). But I do not think many will agree with him. The truth is that no convincing argument for immortality can be given by metaphysics. In this connexion it seems a notable defect in the chapter that no stress is laid on the moral argument as leading up to and finding its completion in the ethical character of God. And it is strange that, though Mr. Webb deals with Plato's idealistic arguments for the immortality of the soul, he does not suggest that behind these idealistic 'proofs,' and giving birth to them, is Plato's profound belief in the moral order of the universe, and his sense of what is implied by it.

There are other points in the Lectures on which, if space had

permitted, I should like to have touched. I shall only add that, though one may disagree with Mr. Webb on some questions, he has beyond doubt made an interesting and important contribution to a very difficult subject. Not the least merit of the Lectures is their admirable tone. Though Mr. Webb has wide learning and sound scholarship, he is never harsh in his criticisms nor unduly confident of his own opinions.

G. GALLOWAY.

VII.—NEW BOOKS.

Psychologie Générale. Tirée de l'Étude du Rêve. By ALBERT KAPLOUN. Lausanne, Payot & Cie, 1919. Pp. 205. Price 4 f. 50.

THIS is a system of psychology based on the study of dreams. M. Kaploun felicitates himself on having avoided the observations of others. He has in this way, he considers, been able to free himself of certain illusions as to the characteristics met with in dreams.

His psychology is purely intellectual, in the sense that desire and will have no commanding place. They follow the intellectual movement and do not guide it. Thus as regards dreams, he is no Freudian. He refuses to correlate the material out of which dreams are woven with either wishes or fears, or indeed with anything characteristic of the real self. He is content to take it as given—due partly to chance, partly to ideas for which bodily affections are responsible. It is, of course, a sound instinct in the psycho-analytic view to try to find a reason for the emergence of any idea in sleep, and for the complexes built up there. M. Kaploun, by leaving this whole question aside, gives a sense of incompleteness.

M. Kaploun's general theory is as follows. The waking self consists of two entirely distinct selves, intimately united; in sleep they are separate. These two selves he calls the "automatic I" (moi automatique) and the "central I" (moi central). To the automatic I belongs the "tension" of waking life, the close touch with reality, the expectant attitude realising itself in movements; to it again belong the latent systems of knowledge which make intelligent awareness possible. The central I on the other hand is adynamic, a pure awareness. It consists in (*a*) a "point," or object of clear consciousness, and (*b*) an explicative function (Fonction explicatrice), called by him familiarly the F.E., which endeavours to synthesise into a whole whatever material is presented to it. In doing this the explicative function can draw on the whole of the latent knowledge possessed by the automatic I: not according to the principle of the association of ideas, in which M. Kaploun does not believe, but in virtue of an ultimate property of itself. The process of thought whereby relevant ideas are selected as needed, forming ever new combinations, is unintelligible on the principle of association. As he suggests in his last and metaphysical chapter, the process is much more like that of reasonance in music. In waking life, this reservoir of latent knowledge is not merely passively at the disposal of the central I, but actively maintained at hand, by the tension of the automatic I. It acts as a constant supervisor, keeping the explicative function (the F.E.) on the right lines.

In sleep—such is M. Kaploun's theory—these two I's are separated. Both are present, but owing to the tension of the automatic I being diminished, touch with reality is lost. It is replaced by the "objectivity" which characterises the "point" of the central I; and the explicative function is left to do its own synthesising without the active supervision

of the automatic I. The F.E. can draw on the latent systems which exist in the automatic I, but, acting without supervision, it "explains" by building up the data presented to it into the fantastic systems we are familiar with in dreams. It follows that dreams have no inner meaning whatever, since the F.E. for M. Kaploun contains none of the characters of personality, which fall rather in the automatic I.

The book is an exposition of this theory. It is based, we are told, on a long study of the writer's own dreams. The book, however, contains very little of his material, being almost entirely devoted to the exposition of his theory.

The attribution of the "tension" of consciousness and the latent systems of knowledge to one self, while the "point" of consciousness and the explicative function are attributed to another self, which can function separately, presents many difficulties. M. Kaploun avoids these difficulties in the case of waking life because he only considers questions of "function" and not questions of "nature"; and since in waking life the two selves are intimately united, the theory of their separate natures does not trouble him. But he has to regard the "point" of consciousness as at once separate from, and at the same time consisting of, the system of ideas which the explicative function builds up; and the F.E. he is compelled in the end to regard as consciousness itself (p. 191)—which however it is impossible to think of as independent in nature of the mass of latent knowledge which for him exists in the automatic I. His treatment of emotion and feeling, will and attention, leaves much to be desired. The "point" of consciousness changes with great rapidity of itself—attention is not to be found here: the "tension" which characterises the automatic I is a second source of change—and here is to be found what he calls "passive attention": "active attention" or will is a third source of change, situated neither in the central I nor in the automatic I. All M. Kaploun can tell us of it is that it is the power of interfering with the natural rhythm of the tension of the automatic I. It alone is will: an extremely abnormal activity, rarely exercised. Conation, then, is not only cut up into three separate activities, but one of them finds no home. As to emotion, it belongs to the tension of the automatic I, and depends entirely upon intellectual elements. So, too, "les passions, préoccupations, désirs, craintes, et en général toutes les tendances et toutes les dispositions affectives, sont, en veille, l'effet de connaissances systématiseés autour de certains objets, auquelles se proportionne la tension du moi automatique". "La sympathie, l'amour, l'antipathie, la haine, sont des directions imprimées à notre tension de veille par la compréhension du sens des personnes qui nous entourent." "Normalement, c'est l'affectivité qui dépend de la connaissance. . . . En générale, en veille, l'affectivité consiste dans les directions que les connaissances latentes impriment à la tension du moi automatique" (pp. 161, 162). They exercise no controlling power. They are effects, which are not causes.

In sleep, the difficulties in M. Kaploun's theory are avoided rather than met, by his readiness to call on the automatic I whenever it is needed, and by his giving to the explicative function and to the "point" (while calling the central I adynamic) all the activity which characterises the automatic I, without giving them any of the tension. It would indeed, we think, be easy to cut out the central I altogether and bring the explicative function and the "point" into closer connexion with the self which contains the tension and the latent systems. The varying degrees of tension would still play the part they do in M. Kaploun's theory of sleep. But for our part, we should have preferred a more positivistic study which would be chary of introducing "selves" but would be content to note and correlate characteristics. That M. Kaploun could have given us this, his

whole book shows; and the general acuteness shown throughout, and his soundness on many points of detail, make it clear that he could have given us a great book. The present book is well worth study; a book in which he presented his material in systematic form, with scientific precision and a positivistic scrupulousness, would be of lasting value.

LEONARD J. RUSSELL.

The Child's Unconscious Mind. By WILFRED LAY. London: Kegan Paul, Trench, Trubner & Co. Pp. 325.

The sub-title of the book is 'The Relations of Psycho-Analysis to Education,' and the book is addressed to teachers and parents. The first five chapters are concerned with the theory of the unconscious mind, the relations of unconscious action and thought to conscious action and thought, and the mechanisms or ways in which the unconscious influences the conscious life of the individual. The latter part of the book gives the educational application of the theory.

The book is written from the Freudian point of view. The author regards the unconscious as primarily concerned with hunger and sex, and treats the mental and physiological life of the individual as one. The aim of education is to transform physical energy into mental. Education has to give greater amptitude to consciousness, "to enable the individual to take in as many and as diverse thoughts as possible," which thoughts must be "thoughts having in them enough of a quality common to all mankind to be accepted by all" (p. 225). The function of the teacher is not to impart information, but to prepare the disposition of the pupil for the acquirement of knowledge. "It is the duty of the teacher and the sole art of teaching to produce an effect upon the pupil without the pupil's knowing how it was done" (p. 319). To fulfil his duty and exercise this art the teacher must study the unconscious, and be acquainted with the mechanisms by which it influences the conscious.

The author's use of the term 'unconscious' will probably prove a stumbling-block to the reader. The vibrations of ether in relation to the sensation of light are unconscious, while the sensation itself is conscious activity; the circulation of the blood and the processes of digestion are unconscious actions, so too are the automatic movements which may be attended to after their performance. The unconscious is said to be the repository of all the ideas and sensations, etc., which have entered our minds, and possibly of others which have not entered our minds during our own lives, but have been inherited. It has ascribed to it all the skill of a dialectician and the guile of a politician, yet it is said to be "an amorphous craving which can best be described as an unreasoning urge to life and love" (p. 50). It is impossible to attach any definite psychological meaning to a term which is used to connote absence of mental life and physical and physiological events, to denote the specific events which have been experienced in the past, and which may be recalled as memories or may be repressed as painful ideas, and further to denote the instinctive tendencies or impulses which characterise the human species, and are basic for mental development, and again, even more broadly, to denote life itself.

The educational application of the theory of the unconscious is new and of special interest to teachers. Mr. Lay writes as an enthusiast, but he is apt to set up half-truths as principles, and to deduce therefrom very questionable conclusions: *e.g.*, "We have no conscious desires that are not compensations" (p. 135). From this it is made to follow that the wife who is over-solicitous about her husband's health desires his death. The per-

son who takes up a crusade against cruelty to children or animals compensates for an unconscious desire to be cruel. "It is impossible to see in the external world what does not already exist in the mind" (p. 155). On the strength of this it is claimed that the critic must himself have the defect which he denounces in others; a poignant deduction for the schoolmaster.

However, if these and similar positive assertions are taken with a grain of salt to preserve the reader's common sense, parents and teachers will learn much from Mr. Lay's book.

BEATRICE EDGELL

Human Psychology. By HOWARD C. WARREN, Stuart Professor of Psychology, Princeton University. Boston: Houghton Mifflin Co., 1919. Pp. xx + 460.

In his first chapter Prof. Warren defines psychology as "the science which deals with the mutual interrelation between an organism and its environment". He explains that "environment includes all external forces and relations which affect the organism—social forces and values as well as physical". The only limitation which he imposes upon himself is that he will deal solely with those results of the interrelation of organism and environment which are expressed in "the mental life of man". The result is a text-book which, while it is of undoubted interest, in many ways, is somewhat overloaded with detail. A considerable portion of the first part of the book consists of biology and physiology for the psychological student. There can be no doubt that the information given is very necessary for an understanding of the mechanism of human responses, but it is not as clear that an elementary text-book of psychology should contain very much of this kind of material. Having dealt with "behaviour," Prof. Warren passes on to "Conscious Experience". Here he first discusses in detail the special senses; then considers "the components of mental states"; divides the latter into primary and secondary and gives each special consideration; passes on to discuss how mental states are related by different laws of succession; and concludes by a study of attitudes, character, and various typical modes of "organised mental life". But all this does not exhaust the range of the book. There is an appendix in which are discussed, "The Mind Body Relation," "Mechanism and Purpose," "Neural Activity," and "The Visual Process". This appendix is intended to deal with debateable problems "for the benefit of advanced students". It is rather sketchy.

To every chapter are appended a bibliography for further reading, and certain "practical exercises". The latter are often good, the former almost always both too "text booky" and too extensive.

Undoubtedly this book contains a considerable amount of interesting material. But most of it is easily accessible in as good a form elsewhere, and on the whole the volume serves to emphasise again the fact that what is particularly needed at this time, if genuine advance in psychology is to be made, is not a multiplication of text-books, but far more serious and well-informed research.

F. C. BARTLETT.

Common Sense and the Rudiments of Philosophy. By CHARLES E. HOOPER. London: Watts & Co., 1920. Pp. viii, 131. Price 4s. 6d. For the Rationalist Press Association.

Mr. Hooper is known to readers of MIND by his articles in October,

1915, and April and July, 1917. This book is the second edition of a book published in 1913, under the title, "Common Sense: An Analysis and Interpretation," noticed in MIND, July, 1914. The only parts much altered are in chaps. ix. and x., in which many passages have been deleted, and some new sections added. The additions in chap. ix. (pp. 69-80) are of most significance for the book, and concern the spheres and nature of science and philosophy. The additions in chap. x. relate to human character and purpose.

The title exactly describes the scope of the book. A very good descriptive analysis of common sense is followed by a brief sketch of the rudiments of philosophy. But the analysis is not carried through to the end. His account of the mental image is peculiar. It "begins to exist when something handled or seen is recognised, not merely as similar to what we have handled or seen before, but as the very same thing which we previously recognised" (p. 17). On what, then, is this recognition based? He speaks (p. 20) of the image as "inferring" its object; as independent of language; as a complex psychological state; as the basis of common sense; but we have been unable to gather his theoretical account of its relation to "sense data" (p. 79), which are described as giving us "our fundamental knowledge of the physical world". Discursive thought (in science) seems to arise out of "mental images" as an explicit analysis and synthesis of the characters of the real objects "inferred" by the mental images (pp. 69-70); but the account is very brief.

Mr. Hooper does not neglect the social and sociological bearings of common sense. His book may be commended as an excellent preliminary study for the general reader.

L. J. RUSSELL.

Lehrbuch der Logik auf positivistischer Grundlage mit Berücksichtigung der Geschichte der Logik. By TH. ZIEHEN. Bonn, 1920. Pp. viii, 866.

Prof. Ziehen's industry and courage in occupying himself during these grievous times with the writing of this enormous volume deserve the highest commendation, but I fear he has, in his resolution to forget the present over a philosophical work, made himself almost unreadable. It is not merely the actual bulk of his book which is appalling. He is so determined to deliver himself of all that he has to say on all topics in any way connected with logic that more than half of his treatise is taken up with what are after all Prolegomena. We have first over 230 pages on the history of logic; then an elaborate discussion of the "epistemological, psychological, linguistic, and mathematical foundations of logic," then an account of the "autochthonous foundation of logic," and it is only at page 459, with the opening of the "fourth part" of the work, that we get to what after all is the business of logic proper, the study of the "operations subsidiary to proof". I think this elaboration of introductory matter unfortunate for more reasons than one. It really compels the author to omit much which is of the highest purely logical interest. All he has to say which goes beyond the ground usually covered in elementary accounts of the concept, judgment, and inference is compressed into two very brief and sketchy final chapters on "proofs" and "theories," which together hardly fill thirty pages. These thirty pages have to represent the material which fills about half, and perhaps the most valuable half, of a book like Bosanquet's *Logic*. And, after all, most of the first half of the book, apart from the historical matter, is largely irrelevant to the logical doctrine of the second half. Whether we are positivists in our general philosophical

outlook or not is a consideration which ought hardly to be allowed to influence our views about the character of the methods available in science. I could wish, for my own part, that the author had kept his attempts to show how logic can be brought into line with his positivism and his own peculiar psycho-physics for a separate book, and had, by way of compensation, given us some chapters of the kind which make Jevons's *Principles of Science* so valuable a work, on the methods by which typical difficulties, such as, *e.g.*, the elimination of errors of observation, or the establishment of standards and units, are effected in the sciences. As it is, he has been forced, to his loss, to confine himself to the barest outlines of "Formal" logic in the old sense of the word. Even the discussion of the elementary principles of probable reasoning is excluded on the not very satisfactory pretext that the subject is "mathematical". Dr. Ziehen stands in his own light, too, by his excessive fondness for novel, and to my mind, often superfluous and uncouth terminology. His coinages are almost as many, and quite as ugly, as those of Avenarius, whom he has perhaps taken as his model. I am afraid that he has gone very far towards making himself unreadable, and this is a pity, for whatever one thinks of his doctrines as a whole, he has much that is interesting and suggestive to say on most of the very wide range of topics of which he treats. It would at least have been well to collect the novel technicalities in a list at the end of the book providing each with its definition, as Dr. Ziehen has actually done for the symbols he uses. The historical material is very full, and will probably be found very useful, especially for the mediæval period. Dr. Ziehen's reading appears to be prodigious, and he has set an honourable example by the care he has taken to indicate where he is referring to a work at second-hand. Unfortunately he seems to have assumed that the history of logic begins with Aristotle; the important work of the Academy is overlooked, even in dealing with such matters as the method of "hypothesis," the pursuit of science by the propounding of *προβλήματα* and the use of "analysis" in geometry. It is also unfortunate, in view of the author's polemic against "logisticians," that he seems quite unacquainted with the revolution made in symbolic logic by Peano. The subject seems for him to end with Schröder's elaboration of the methods of Boole, hence many of his criticisms are really a whole generation behind the time. Acquaintance with the work of Peano, the later works of Frege, or the *Principia Mathematica* of Whitehead and Russell might have improved the chapter on Judgment considerably. As it is, the Theory of Types, perhaps the most important contribution made to logic for centuries, is ignored, and in one place there is a bad confusion between the relations represented in the Peano-Russell symbolism by ϵ and $\supset$. Acquaintance with Frege's symbolism, again, would probably have led to a clear recognition that the real peculiarity of Euclid's reasoning is simply the use of the inference from "any" to "every".

Of Dr. Ziehen's epistemology, which seems to be deduced from his own psycho-physics, I do not propose to say much. I am not sure that I understand it. As far as I do follow him, he seems to be attempting to construct a "normalised" or "standardised" world of terms with a definite character and standing in definite relations, such as we presuppose in logic, out of a "given" chaos of "absolute becoming". I do not see how this is possible. At bottom Dr. Ziehen appears to me to be committing that very fallacy of confusing the "philosophical" issue with that of positive science against which John Grote's *Exploratio Philosophica* is an eloquent protest. At any rate, I feel sure that the '*Gignomenologie*' on which he bases knowledge is just a dogmatic metaphysics; I may be wrong in thinking that it is bad metaphysics, but I do not believe I am wrong in holding that it is strictly irrelevant to logic. In particular I

cannot grasp what seems to be the author's main contention. He appears to hold that the principle of the syllogism in Barbara, the principle of Contradiction and that of Excluded Middle are all derivable by immediate inference from the principle of Identity, which thus becomes the foundation of logic. And the principle of Identity, as a logical law, is not axiomatic (for there really are no axioms); it is somehow got out of the 'gignomenal' impossibility of thinking at the same moment 'A is B' and 'A is not B'. I cannot follow any of the steps of this construction. As to the syllogism, Dr. Ziehen quite overlooks the points (1) that over and above the principle he means ($a \supset b$, $b \supset c$. $\supset$. $a \supset c$), actual inference requires also a second and different principle, never mentioned by him, and incapable of being expressed symbolically, "if a can be asserted, and if $a \supset b$, then b may be asserted". Even the principle meant by Dr. Ziehen cannot be got out of the principle $a = a$, nor yet can those of Contradiction and Excluded Middle, without a number of other independent postulates, as he will soon find if he attempts a rigorous 'symbolical' proof. Finally, I do not in the least know what to make of the underlying 'gignomenological' Law of Identity. Granted that I cannot at the same moment *think* 'A is B' and *think* that 'A is not B,' how does this fact prove that A cannot *be* B and not be B at the same moment? No one can "at the same moment" think all the propositions which are true of A "at the moment t". We need to think them successively. So my need to *think* 'A is B' and 'A is not B' successively is no reason at all for holding that A may not at once be B and not be B. The "foundation" of my certitude on that point, after all, must be "autochthonous".

In Dr. Ziehen's actual logical views I do not see very much that is original. The treatment of "Induction," which is characteristic, appears simply to reproduce Mill more succinctly. Dr. Ziehen seems unacquainted with Bosanquet's *Logic*; he would find there a very much more thorough attempt to analyse the procedure of the natural sciences than his own. It is a little surprising that a writer who justly insists on Mill's point that generalisation is characteristic of all "Induction" seems quite blind to the horrible difficulty attending on generalisation (I put it as Dr. Broad has put it in MIND). If "Induction" depends only on the Theory of Probability, it is easy to show that *every* scientific generalisation is infinitely improbable. Since we do, in fact, succeed in making generalisations, there must be some principle involved in generalisation which is not included in the premisses of the Calculus of Probabilities. But what *is* this principle? Dr. Ziehen has really nothing to say beyond repeating Mill's unprofitable allusions to a wholly undefined "uniformity of nature". If only he had spared time from his attempts to educe science out of "gignomenology" to grapple with this really formidable logical problem!

A. E. TAYLOR.

Sinnesphysiologische Untersuchungen. By JULIUS PIKLER, Professor in the University of Budapest. Leipzig: Ambrosius Barth., 1917. Pp. viii, 516.

Schriften zur Anpassungstheorie des Empfindungsvorganges. 1stes Heft: *Hypothesenfreie Theorie der Gegenfarben.* 26th July, 1919. Pp. viii, 104.

2tes Heft. *Theorie der Konsonanz und Dissonanz.* 2nd Aug., 1919. Pp. 34.

These investigations are classed by the author as physiological. But it may be observed that their basis of inference is largely, if not wholly,

physiological. Perhaps necessarily so. But as we know next to nothing of the nature of the waking and sleeping states or of the subtle physiological matters in question throughout these works by direct methods, the ground of argument like the detail of facts observed is essentially psychological.

What, then, is the "Anpassungstheorie," the theory of adaptation? Prof. Pikler is thoroughly dissatisfied with what he calls the "Erregungstheorie"—the theory that the data of sensation—what remains of sensory processes when we abstract from them all cognitive, associative, and allied influences—are correlated with or 'parallel' to certain complexes of neural excitation, these in turn being caused by stimuli applied to the sense-organs: in other words, the ordinarily accepted psychological theory. For this theory leaves everything dead and inert and is really unable to account for the half of what must be held to be data of sensation in the sense indicated. No! "Errerung"—and I suppose there must be some sort of excitation somewhere—must find its complement in a response from within, an adaptation of the internal impulses of the brain to these intruding forces. At every moment an inner resistance is banked up against the outer current, shaping itself to what it encounters and girding itself for the next phase to come All this thoroughgoing duality goes back to the fundamental alternative of sleeping and waking life. So Prof. Pikler's theory sets out from a theory of sleep.

He follows a line of thought that has been sketched by Claparède for the problem of sleep. We are not generally aroused from sleep by some stimulus and kept awake like Strümpell's patient by the constant titillation of the senses. Like him really we also rather wake up spontaneously, without any consciousness of a waking stimulus. We feel besides whether our sleep has been completed or not. In short waking like sleeping must have some inner cause.

Sensations cannot therefore be correlated with characteristic physical effects proceeding from stimuli. For that would imply a separateness of each from all others and changeless receptors. Such independent stimuli could not possibly yield the unitary mind we know. *Wakefulness* must be the agent. "As the stimulus may do nothing in the organism, *it alone* must produce the sensation. Spontaneously, before the stimuli would exert any physical action in the organism or by force of their active impulse and a certain importance as stimuli annul sleep (it may be), *it* must be trained upon all the gateways of stimulus, keeping watch at each. Without the stimuli co-operating physically or uniting at one place in the organism, there must be present in this tension or watching an original unity, a unity that unfolding outwards into a manifold, takes all stimuli into consideration at once. And it must spontaneously, in accord with its nature as an instinct inherently most essential to the organism, produce for every stimulus a sensation corresponding to its kind. . . . Thus for the sensory process only the following possibility remains: the sensation arises inasmuch as wakefulness prevents the physical action of the stimulus in the organism by producing an exact counterbalance to the latter. The sensory process is a balancing, accommodatory maintenance of organisation" (eine ausgleichende, anpassende Erhaltung der Organisation) (p. 75 f.).

I have given this first statement of the theory in Prof. Pikler's own words. I do not find his many other statements of it any more lucid or convincing. The rest of his book is an enthusiastic application of the theory to special cases, always in these very general and vague terms. One cannot but wonder very often what the "Erregungstheorie" has done or left undone to deserve such beating, and what is gained by handing the whole business over to this "ausgleichende anpassende Erhal-

tung des Organismus". It reminds us strongly of our old friend the ego positing itself so nimbly and gaily in its wonderful manifold, and needing no dead thing to stir its stuffless soul. There is too big a leap from the general differences of sleeping and waking to the special analysis of the finest sensory details.

"Sensory negation (*e.g.*, 'there is no red here') can with the greatest precision be defined as the repression of a hallucination to which we are inclined. For if the restrained disposition is not as such a complete disposition to sensation, it is inconceivable that its repression should yield the negation of the occurrence of a sensation." No-red is just as much a direct fact of perception as red.

"Sensation is the exercise of a capacity resident in me over whose exercise from within, and in accordance with my needs I have complete power and decision." "I see red exactly as I extend my arm, out of myself, spontaneously in an act of decision" (Nicht-sein hat seinen Ort und seine Zeit).

The special studies in this book are concerned with the application of the above formulas to a number of sensory problems—motion phenomena, stereoscopy by disparation of images, cinematography and the cinematographic nature of binocular vision, the geometrical optical illusions, the Ranschburg phenomenon, time-sense organ, and its manner of function, etc.

In the acoustical paper Prof. Pikler writes: "In the octave also [*i.e.*, just as in the comparison of a line twice the length of another] I perceive . . . double the pitch in comparison with the lower tone. If anyone is unable to make this comparison at once, let him take first the successive interval lower tone—major third, then the successive interval lower tone—fifth, and then finally the successive interval lower tone-octave, and he will now quite clearly perceive the double pitch of the lower tone in the octave." It is not a case of recurrence of quality or the like, but just of exactly the double pitch. And Prof. Pikler can even perceive in the fifth the relation, not of 2 : 3, but of half-duplication 1 : $1\frac{1}{2}$, "a relation that by the way is identical with the former, only livelier". And so on. I am fully persuaded that the sensory *volume* of a tone an octave higher than another is half (geometrically exactly or with certain functional latitude) that of the lower tone. And I have often done what Prof. Pikler now recommends in order to see if my ear and observation would confirm my inference. But, while they do not lead me to doubt the latter at all, and are even encouraging, I should not venture to assert that they precisely confirm it. If I wanted a confirmatory judgment, I must say I should not now accept either my own or Prof. Pikler's as being useful evidence, but only those given under certain very stringently controlled conditions. And even these would surely at the best be rather weak-kneed. Exactness in the auditory observation of doubleness as such is surely more than we can expect.

H. J. Watt.

Received also :—

W. R. Sorley, *A History of English Philosophy*, Cambridge University Press, 1920, pp. xvi, 380.

William Macpherson, *The Psychology of Persuasion*, London, Methuen & Co., 1920, pp. 256.

J. J. Findlay, *An Introduction to Sociology*, Manchester University Press, London, New York, Longmans, Green & Co., 1920, pp. xi, 304.

W. T. Stace, *A Critical History of Greek Philosophy*, London, Macmillan & Co., 1920, pp. xiv, 386.

Richard Duncan Taylor, *The Mystery of Life, as Interpreted by Science*, London and Felling-on-Tyne, The Walter Scott Publishing Co., 1919, pp. ix, 176.

Josiah Royce, *Lectures on Modern Idealism*, New Haven, Connecticut, Yale University Press, 1919, pp. xi, 266.

Knight Dunlop, *Personal Beauty and Racial Betterment*, London, Henry Kimpton, 1920, pp. 95.

René Kremer, *Le Néo-Réalism Américain*, Louvain Institut de Philosophie, Paris, Librairie, Félix Alcan, 1920, pp. x, 310.

Mons. Rodolfo Maiocchi, *Galileo e la Sua Gondana Bibliotecca di Coltura Religiosa*, Milano, 1919, pp. 224.

Francesco Olgiati, *Carlo Marx: Bibliotecca di Coltura Religiosa*, Milano, 1920, pp. xix, 337.

Fr. Agostino Gemelli, *Religione e Scienza*, Milano, 1920.

Emilio Chiocchetti, *La Filosofia di Benedetto Croce*, Milano, 1920.

A. G. Tansley, *The New Psychology: and Its Relation to Life*, London, George Allen & Unwin, 1920, pp. 283.

Marcel Labordère, *Une Profession de Foi Cartésienne*, Paris, Librairie, Armand Colin, 1919, pp. 142.

G. Noel-Armfield, *General Phonetics*, 2nd edition, Cambridge, W. Heffer & Son, 1919, pp. xii, 146.

William McDougall, *The Group Mind*, Cambridge University Press, 1920, pp. xvi, 304.

Raymond H. Wheeler, *The Synæsthesia of a Blind Subject*, Oregon University Press, 1920, pp. 61.

Milwoïe Pavlovitch, *Le Langage Enfantin*, Paris, Edouard Champion, 1920, pp. viii, 203.

St. George Lane Fox Pitt, *Free Will and Destiny*, London, Constable & Co., 1920, pp. xix, 100.

Louis Rougier, *La Philosophie Géométrique de Henri Poincaré*, Paris, Librairie, Félix Alcan, 1920, pp. 208.

Louis Rougier, *Les Paralogismes du Rationalisme*, Paris, Librarie, Félix Alcan, 1920, pp. xiv, 540.

Bernard Bosanquet, *Implication and Linear Inference*, London, Macmillan & Co., 1920, pp. ix, 180.

J. Alexander Gunn, *Bergson and His Philosophy*, London, Methuen & Co., 1920, pp. xxi, 190.

E. J. Urwick, *The Message of Plato*, London, Methuen & Co., 1920, pp xii, 263.

F. W. Westaway, *Science and Theology: their Common Aims and Methods*, London, Glasgow, and Bombay, Blackie & Son, 1920, pp. xiii, 346.

A. Einstein, *Relativity*, translated by Robert W. Lawson, London, Methuen & Co., pp. xiii, 138.

Florian Cajori, *A History of the Conceptions of Limits and Fluxions in Great Britain from Newton to Woodhouse*, Chicago and London Open Court Publishing Co., 1919, pp. viii, 299.

VIII.—PHILOSOPHICAL PERIODICALS.

THE BRITISH JOURNAL OF PSYCHOLOGY. Vol. ix., Parts 3 and 4. **John Laird.** 'The Psychological Interpretation of Sense Data.' [Exposes the inadequacy of the theory that sense data do not belong to the subject-matter of psychology, and the falsity of the view that presentations are fictions. A detailed discussion of visual sense data leads to the conclusion that "meaning" belongs to a visual presentation in precisely the same sense as shape and colour, meaning being here limited to "presented meaning" and not including logical implications. In "complication" we have an example of a non-visual meaning of a visual presentation. Other kinds of sense data are similarly discussed, as is also the development of sense data.] **Carveth Read.** 'The Unconscious.' [Discusses physiological aspects of various Freudian ideas in reference to instinct, repression, unconsciousness, and dissociation, and connects with the doctrine of repression such phenomena as inattention to what is biologically without interest. Defends explanation by physiological processes as necessary, there being no absolutely independent science of psychology. Volitional repression operates through the counteracting of motor expression, including language. Ninety-nine per cent. of our forgetting is merely due to unimportance of impressions or idea, and many slips are due to "organic disrepair".] **Victoria Hazlitt.** 'The Acquisition of Motor Habits.' [A record of experiments on the learning of mazes by rats. Results show that with practice rats improve in ability to acquire motor habits, and that any hindrances to learning which may be offered by the survival of old habits are more than counterbalanced by the mastery which the practised rats gain over the general situation. The practised rat runs more quickly, enters blind alleys less often, very seldom returns on his path, and he seems much less upset by making a mistake than the unpractised rat.] **Godfrey Thomson.** 'The Proof or Disproof of the existence of General Ability.' [Examines some typical conclusions based on a comparison of entire and partial correlation coefficients in psychology and pedagogy; shows that the comparison of a partial correlation coefficient $r_{12 \cdot 3}$ with an entire coefficient r_{12} is no sure guide of the extent to which the connexion of 1 and 2 is via 3. Concludes that there have been made sweeping deductions as to the presence of general ability in many forms of activity, based upon methods depending largely, if not entirely, on a misinterpretation of the methods of partial correlation.] **Godfrey Thomson.** 'The Hierarchy of Abilities.' [Replies to Prof. Spearman's criticism of another earlier investigation on "A Hierarchy without a general factor" and offers the following theory of ability as being consonant with results reached. The mind in carrying out any activity such as a mental test, has two levels at which it can operate. The elements of activity at the lower level are entirely specific, but those at the higher level are such that they may come into play in different activities. Any activity is a sample of these elements. The elements are assumed to be additive like dice, and each to act on the

"all or none" principle, not being in fact further divisible.] **J. C. M. Garnett.** 'General Ability, Cleverness, and Purpose.' [Shows how confusion is likely to arise in discussions of the question whether correlations obtaining between a set of mental tests are due, on the one hand, to a single general factor—"general ability"—entering without group factors into all of the qualities tested, or, on the other, to an indefinitely large number of independent factors each of which may enter as a group factor into any two or more of the tests.] **J. C. M. Garnett** and **Godfrey Thomson.** 'Joint Note on the Hierarchy of Abilities.'

JOURNAL OF PHILOSOPHY, PSYCHOLOGY AND SCIENTIFIC METHODS.—xvii., 3. **B. Ruml.** 'The Need for an Examination of Certain Hypotheses in Mental Tests.' [Comments on the "astonishingly meagre results in theoretical value" of these tests, and suggests that intelligence being 'multi-dimensional' is not properly represented by linear measurements.] **A. K. Rogers.** 'Professor Strong's Theory of "Essence."' [Charges it with ambiguity]. **R. C. Lodge.** 'Tests of Truth.' [First shows, after the manner of Cook Wilson, that an (absolute) criterion is involved in an infinite regress, that "there is a gap between absolute truth, with its universal and necessary criteria *a priori*, and the concrete truths with which human experience and the specific are concerned," and that it is "hopeless to attempt to bridge this gap . . . between empirical truths . . . and metaphysical Truth . . . from the more metaphysical side," and then proceeds to do so "from the more empirical side" by suggesting "the development of science into better science" . . . "towards a better, finer, truer, more scientific knowledge". This would appear to be really the pragmatic solution of the problem.] xvii., 4. **J. T. Shotwell.** 'Christianity and History, I.' [Points out that Christianity did not enlist the services of a first-rate historian in its beginning, and that its other-worldliness was unfavourable to historiography.] **H. H. Parkhurst.** Report on the 19th Annual Meeting of the American Philosophical Association. xvii., 5. **J. T. Shotwell.** 'Christianity and History, II. Allegory and the Contribution of Origen.' [Owing to the Messianic element in it, Christianity was also a historical religion, which rejected the allegorical interpretations of Origen and developed an elaborate chronology from the creation of the world to the birth of Christ.] **J. Warbeke.** 'A Theory of Knowledge which Foregoes Metaphysics: A Reply to Dr. Schiller.' [*Cf.* xvi., 20; explains that by metaphysics he means "a systematic effort to co-ordinate our most general assumptions into logical coherence," but will not allow assumptions to be made 'methodologically'.] **A. I. Gates.** Report on the 28th Annual Meeting of the American Psychological Association. xvii., 6. **J. T. Shotwell.** 'Christianity and History, III. Chronology and Church History.' [On the importance of Eusebius.] **M. T. Collins.** 'Spaulding's Freedom of the Reason.' [In each of three senses it ultimately involves indeterminism.] **G. Boas.** 'A Note for the History of Affective Psychology.' [On J. J Reich's dissertation of 1695 on the bodily effects of the emotions.] xvii., 7. **W. T. Bush.** 'The Present Situation in Philosophy.' [A discussion of N. K Smith's Inaugural Lecture in a spirit of an 'empirical' idealism, to which scientific Naturalism leads, and which does not demand superhuman values or *a priori* knowledge. For it "judgments that claim universal validity . . . are either descriptions of natural regularities observed and remembered, or rules of procedure," so that "that the rule will work this time as it has in the past is a methodological assumption, never a metaphysical discovery in advance of the fact."] **I. Babbitt.** 'Rousseau and Conscience.' [Reply to Schinz's review

in xvii., 1. For Rousseau conscience was an 'emotion'.] xvii., 8. **W. D. Wallis.** 'Motive and Caprice in Anthropology and History.' [Both have two motives, the descriptive and the speculative, which cannot be separated, because narrative must select and selection implies valuation.] **W. M. Salter.** 'A note on Dr. Strong's Realism.' [A further attack on his theory of 'essences,' which really "exist only in thought and have no part in an ontological or epistemological explanation of things".] **R. C. Lodge.** 'The Logical Status of Elementary and Reflective Judgments.' [Holds that for 'modern logic' judgment is not '*Urteil*' but '*Beurteilung*,' and that properly "there is only one judgment in this sense, the transcendent ideal of Omniscience," so that " if we care to speak of 'judgments' at all, in the sphere of finite human thinking, we can legitimately refer only to the methodical attempts to approximate to realising this ideal of judgment". So "the reference to reality should be explicitly recognised as mediate, far-off . . . and 'judgment' will mean, not completed judgment but this progressive advance in consistency and individuality, this taking one step nearer to the indefinitely distant goal." It is assumed throughout that the formal claim to refer to 'reality' is a sufficient guarantee of the success of the reference, even though admittedly this could be tested only if 'omniscience' were reached.]

Revue de Métaphysique et de Morale Novembre-Decembre, 1919. **O. Hamelin.** 'La volonté, la liberté, et la certitude d'après Renouvier.' [Renouvier's treatment of freedom and determinism is perhaps his best work. But he restricts the sphere of will, and even of mind, in a way that fails to do justice to the facts and fits in but ill with his general views.] **L. Weber.** 'Les derniers progrès de la physique.' [An admirable accouut of the progress of physics since the war. Discusses the theory of relativity and its opponents, the theory of quanta and its applications in Bohr's atomic model, and the work of the Braggs on the atomic structure of crystals. Regrets the small part taken by French scientists in these great advances.] **R. Lenoir.** 'La psychologie de Ribot et la pensée contemporaine.' [Ribot's work, valuable as it is, was the product of its age, and contains certain exaggerations due to its being a protest against the intellectual stagnation of the Second Empire.] **A. Meillet.** 'De la formation des maîtres primaires.' **Th. Ruyssen.** 'La controverse nationalitaire.' [Natural boundaries and racial characteristics are not the real criterion of nationality; they are too indefinite to be the actual forces that bind together communities. Language and tradition are probably the most important factors, but even they only operate strongly when continually forced on popular attention either by the attempts of aliens to destroy them or by those of intellectuals to preserve or restore them. Extreme insistence on the rights of small nationalities can only lead to anarchy; but there is some hope in the principle of allowing them a good deal of autonomy within larger states, on condition that they will not make themselves too troublesome.] 'Nécrologie.' Georges Siméon (1888-1919). [Contributed articles to the *Revue* from the trenches on the philosophy of patriotism. Died of the after-effects of poison-gas.] Janvier-Mars, 1920. **V. Delbos.** 'Les facteurs kantiens de la philosophie allemande.' [Traces the notion of *a priori* system, and the steadily increasing emphasis on it, as against the particular sciences, from Kant through Reinhold, Fichte and Schelling, to Hegel. Fichte's assumption of intellectual intuition is only verbally opposed to Kant's denial of it; for Fichte rejected things-in-themselves, and Kant used the term to denote a supposed knowledge of such objects. The Kantian analogue to Fichte's intellectual intuition is our knowledge of the moral law.] **R.**

Mourgue. 'Le point de vue neuro-biologique dans l'œuvre de M. Bergson.' [Holds that recent advances in the physiology and pathology of brain and nervous system have tended strongly to support Bergson's views as to their nature and functions. A long article with a very full bibliography.] **G. Davy.** 'Durkheim' (*suite*). ['D.'s ultimate object was to work out a scientific moral philosophy. But he saw that this depends on the nature of man, and that the latter is not given once for all but varies with the type of society in which he lives. Hence his sociological studies. As a sociologist he regarded societies as complexes with special laws of their own which are not deducible from any amount of knowledge of their constituents in isolation. Hence his refusal to subordinate sociology either to biology or to psychology whether individual or social. There was nothing in the least mystical in this attitude of D.'s; he simply recognised irreducible facts and refused to be bound by the dogma that all explanation to be scientific must be mechanical. He has been accused quite unjustly of materialism; but he simply studied material products as permanent signs of the living activities of societies; and, particularly in his later work, he insisted on the importance of ideal factors in the life of societies. (A very able article.)] **G. Marcel.** 'Les "Principes Psychologiques" de J. Ward. [A highly appreciative synopsis of Ward's work, ending however with a doubt whether Bradley is not nearer the truth on the subject of attention.] 'Nécrologie.' [Georges Lechalas (1851-1919); Paul Lacombe (1834-1919).] Reviews of books and journals.

Revue Néo-Scolastique de Philosophie. No. 84. November, 1914-1919. **Louvain.** [A word of heartfelt congratulation on the reappearance of this review for the first time since the fatal summer of 1914. All of us will heartily sympathise with the noble and dignified words of the editor (M. Maurice de Wulf) in his opening address to his readers. The last five years ought to be enough to convince thinking men once for all of the bankruptcy of "relativism" in ethics and the need for insistence on "immutable and eternal" morality, even if some of us cannot forget that it is precisely the two philosophers to whom neo-scholasticism never seems able to be quite just, Plato and Kant, who have historically done the most for the "good cause". At least we shall all be at one in wishing the *Revue* a long and illustrious life, and hoping that its very able contributors will continue to render solid service to the cause of true science and sound morality. But is M. de Wulf altogether well-advised in making common cause with "new realists" here and in the United States against what he calls, by the usual Thomist misnomer, the "agnosticism" of Kant? Can he be aware how closely allied the "new realist" movement is with an atheism as repugnant to Kant as it is to himself?] Contents. **H. Pinard.** 'Sur la Convergence des Probabilités.' [First part of an essay which aims at proving that a convergence of probabilities may be sufficient to establish certainty and at explaining the logic of the procedure.] **H. Lebrun.** 'La Théorie de la Mutation' (*concl.*) [Conclusion of a study begun before the war. De Vries has the merit of having "bridged the gulf" between the partisans of immutably fixed species and the "transformists," Lamarck and Darwin. His conceptions agree with the facts of palæontology and the Christian conception of creation. But his theory is not complete, and can give no explanation of the adaptation of organisms to their environment.] **A. Farges.** 'Le Sens Commun.' [Chiefly directed against Bergson. "Common sense" = the agreement of mankind on certain very elementary truths, especially those necessary for the conduct of life. M. Farges regards this agreement as sufficient to refute, *e.g.*, the philosophy of Berkeley, which he seems not to understand, and apparently also the arithmetic of transfinite numbers. The direct purpose of the

article is to insist upon the incoherencies in the thought of Bergson and Le Roy, but M. Farges seems to think the appeal to "common sense" sufficient to discredit all modern philosophers, with perhaps a partial exception in favour of Reid.] **G. Lechalas.** 'Identité et Réalité d'après M. Meyerson.' [Conclusion of a very able article on the presuppositions of physical science.]

ARCHIVES DE PSYCHOLOGIE. Tome xvii., No. 3. **J. L. des Bancels.** 'Instinct, émotion et sentiment.' [James was concerned with the mechanism (reflex) and content (organic sensation) of emotions, and hardly touches the question of function. In fact, emotion is the default, the misfire of instinct. Sensory pain (*douleur*) is to be distinguished from affective unpleasantness (*peine*), which signals danger as pleasantness signals safety to the organism. It is impossible to choose between central and peripheral theories of feeling, though the latter are the less speculative.] **H. Flournoy.** 'Symbolismes en psychopathologie.' [Symbolism sometimes shows on the face of the record, sometimes must be sought by patient analysis; sometimes is explained by the subject, sometimes is revealed indirectly by associations. Five cases (dream, hallucinatory episode, hysterical spasm, infantile rite, flag-design of a paranoidal dement) are quoted in illustration.] **H. Flournoy.** 'Quelques remarques sur le symbolisme dans l'hystérie.' [Description of a case of hystero-organic association (symbolisation with imitation). It is not necessary in every instance to have recourse to the sexual motive; aside from that, the Freudian explanation by apperceptive insufficiency is adequate. In any event there is no 'proof' of symbolism: one must study a long series of cases, and use common sense.] **C. E. Guye.** 'Réflexions sur la classification et l'unification des sciences, àpropos du principe de relativité.' [The sciences may be classified according to their subsumption under the primordial concepts of number, space, time, matter, life and thought. They can be unified only as relations are established among these seeming ultimates, and here the principle of relativity promises to do good service.] Bibliographie.—Tome xvii., No. 4. **L. Cellérier.** 'Des réactions organiques accompagnant les états psychologiques.' [A review of published work (rate of pulse, peripheral volume) shows that there is a constant reaction to activity, physical or mental, but no specific, characteristic, constant reaction to pleasantness and unpleasantness. The 'affective' reaction is in truth a reaction of activity.] **R. de Saussure.** 'Apropos d'un disciple d'Unternährer.' [A study of the life and writings of Unternährer (a Swiss mystic of the 18th century, founder of a still persisting sect), in the light of the history and behaviour of a paranoiac disciple, suggests a condition of sexual inferiority.] **Y. Delhorbe.** 'Recherches sur la corrélation entre la mémoire des mots et la mémoire des images.' [Experiments on 40 boys and 8 girls, from 10 to 14 years of age, with series of words and of pictures of single objects, yield so high a correlation that it will be needless in future to test both forms of memory. At least three tests are required as a basis of inference.] **E. Claparède.** 'Percentilage de quelques tests d'aptitude.' [Normal tables of 10 tests for individuals of both sexes from 7 or 8 years of age to maturity.] **E. Claparède.** 'De la constance des sujets à l'égard des tests d'aptitude.' [The results of a number of tests, repeated 4 or 6 times, indicate a constancy sufficient for general but not for individual psychology. They leave it uncertain whether the most representative value is the arithmetical mean, the median or the maximum.] Recueil de Faits: Documents et Discussions. **C. Werner.** 'XIV^me^ réunion des philosophes de la suisse romande.' Bibliographie. Nécrologie. Notes diverses.

ZEITSCHRIFT F. PSYCHOLOGIE. Bd. lxxv., Heft 1 und 2. **C. Stumpf.** 'Apologie der Gefühlsempfindungen.' [Detailed discussion of the objections raised to the theory of centrally excited concomitant sensations by Brentano, Külpe, Titchener, Ziehen, and briefer reply to Becher and Oesterreich.] **C. Stumpf.** 'Verlust der Gefühlsempfindungen in Tongebiete (musikalische Anhedonie).' [Case of a player in a military band ('cellist and bassoonist) who, without impairment of hearing (except that the noisy component of compound tones is somewhat unusually pronounced), has lost all direct pleasure in hearing or performance; interpreted as loss of affective sensation in the sense of the writer's theory.] **G. Heymans.** 'In Sachen des psychischen Monismus, iii.' [(1) The question why we perceive objects and not brain-processes, in so far as it offers a real problem, is answered by the importance which the object possesses, by way of community and causality, for our knowledge of nature. (2) Life is like dream in that both afford material of knowledge; but the limitations and unreliability of dream-knowledge are due to circumstances which have no parallel in life.] Literaturbericht. Bd. lxxv., Heft 3 und 4. **J. Pikler.** 'Ueber verdoppelnde und vereinfachende Kinematographie und die kinematographische Natur des binokularen Sehens.' [If there are double images in the field, and the one eye is alternately closed and opened, the corresponding image apparently moves to and from its fellow. From this and similar observations the writer argues (against Hering) to a unitary sensation-process which represents a spontaneous and teleological adaption of the organism to its visual surroundings.] **H. Henning.** 'Der Geruch, iii.' [Deals with recognition (familiarity, unfamiliarity, strangeness; typical cases), fatigue, after-effect and toxic effects. Aronsohn's experiments on quick adaptation and resulting partial anosmia are not confirmed. Odorous particles embedded in the mucous membrane have a long after-effect; hence Aronsohn's experiments with liquids are also untrustworthy. Many of the unpleasant concomitants and after effects of narcosis are attributable to the sense of smell.] Literaturbericht. Bd. lxxv., Heft 5 und 6. **A. Goldscheider.** 'Ueber die physiologische Psychologie des Willensvorganges.' [Ziehen's associative account of attention and will must be declared a failure. It is true that interested attention derives from constrained attention, and that the process of will appears as the outflow of stored mental energy due, in part at least, to the unused remainders of psychical stimuli; will is, nevertheless, an autonomous activity of consciousness. The process of will requires neither a motivating feeling nor an antecedent complex of idea and desire; it may inhibit feeling; and Wundt's identification of volition with emotive course goes much too far. Will is not itself experienceable as content of consciousness: the concept derives from the experience that fulfilment follows desire as the result of an intraconscious cause.] **C. Stumpf.** 'Binaurale Tonmischung, Mehrheitsschwelle und Mitteltonbildung.' [The binaural tone-mixture of von Liebermann and Révész is a matter simply of the differential limen of simultaneous tones and of the formation of a middle tone from near-lying primaries.] Literaturbericht. Bd. lxxvii., Heft 3 und 4. **K. Groos.** 'Untersuchungen über den Aufbau der Systeme: vii. Die monistische Lösung.' [Discusses various types and psychological motives (intellectual, emotional) of monistic thought; the parallelistic monism of Spinoza and of later writers (Mach and Wundt; Leibniz, Kant, Stern); materialistic monism; critical monism (Riehl); psychical monism (Heymans) and its critics (Becher). In conclusion the author considers the viability of a monadological monism, according to which our mind is the *Ansich* not of the brain but of a single *Uratom* of the brain (such a view avoids mental atomism and allows immortality), and also the possibility of a twofold

parallelism, of atoms with an X of potential activity, and of space (continuum, void) with mentality.] **K. Lewin.** 'Die psychische Tätigkeit bei der Hemmung von Willensvorgängen und das Grundgesetz der Assoziation.' [Experiments upon the transposition and rhyming of meaningless syllables show that neither consecutive repetition nor *Aufgabe* suffices to establish association. Everything depends on the nature of the 'activity of performance' which runs its course between instruction and reaction. To secure association, the experimenter must secure a readiness of reproductive 'activity' (in this technical sense) before his presentation of the one term of the pair; it is also important, though seemingly not essential, that the two members have been originally conjoined by the same 'activity'.] **W. Koehler.** 'Die Farbe der Sehdinge beim Schimpansen und beim Haushuhn.' [Experimental rebuttal of Katz' criticisms.] **G. Wolff.** 'Zur Frage des Denkvermögens der Tiere.' [Report of tests on Krall's blind horse Berto, whose powers are upheld against the criticism of 'Faustinus'.] Literaturbericht. Bd. lxxvii., Heft 5 und 6. **A. Gelb** mit Unterstützung von **M. Bentley.** 'Bibliographie der deutschen und ausländischen Literatur des Jahres 1915 über Psychologie, ihre Hilfswissenschaften und Grenzgebiete.' [2635 titles, as against 2642 for 1914.] Bd. lxxviii., Heft 1 und 2. **W. Stern.** 'Die Psychologie und der Personalismus.' [Advocates 'critical personalism' as the doctrine which shall set psychology in its right relation to philosophy. The teleological series phenomenon, act, disposition (faculty), ego is paralleled on the physical side by the series phenomenon, act, disposition, organism. Ego and organism are then integrated in the psychophysically neutral concept of person; and the co-operation of person and world (viewed hitherto as nativistic or empiristic) becomes an affair of 'convergence' in which outer determination and inner purpose are alike involved.] **F. Seifert.** 'Zur Psychologie der Abstraktion und Gestaltauffassung.' [Experiments on the positive abstraction of colour and form, with formed and formless complexes, undertaken to determine the influence of participation-in-form upon the abstractive process. Form works against abstraction: first, by exercising a direct constraint upon the element to be abstracted, by way of functional inclusion and of levelling or assimilation; secondly, by absorption or diversion of attention. The paper discusses the stages in abstraction; positive and negative abstraction; the psychology off orm (*Gestalt*); and reports quantitative experiments with stimuli of the sort used by Grünbaum and Moore.] Bd. lxxviii., Heft 3 und 4. **J. Lindworsky.** 'Voruntersuchungen über die Perseverationstendenz der Vokale in der geordneten Rede.' [Raises the question whether in connected discourse, free of technical terms, stylistic variation, etc., the accented vowels show a tendency to perseveration. Experiments by a modification of Marbe's method (number of syllables between repeated vowels; discrimination of verbal and phrasal accent) give a probably affirmative answer. The writer seeks to account for exceptions and individual differences.] **G. J. B. Muller.** 'Die Assoziation sukzessiver Vorstellungen.' [Münsterberg's denial of successive association is not warranted; his results may be accounted for by distraction of attention and ideational type.] **H. Henning.** 'Versuche über die Residuen.' [Ranschburg's neuropsychological law of sensory fusion (physiological inhibition) of similars is traversed by Aall's doctrine of ideal residua. Critical examination of previous work, and new experiments mnemometer, tachistoscope) shaped directly to the issue, prove that the supposed 'fusion' is always a matter of cognition, *i.e.*, of the residual component. Ranschburg's memory-results are due to the familiar associative inhibitions. Finally, experiments by the writer's method of two-word

association, with various kinds and degrees of similarity between the stimulus-words, show the importance and throw light on the character of the residua.] Literaturbericht. Bd. lxxviii., Heft 5 und 6. **P. Zimmermann.** 'Ueber die Abhängigkeit des Tiefeneindruck's von der Deutlichkeit der Konturen.' [Experiments with skeleton prisms (dark, light; various backgrounds; viewed with naked eyes, through lenses, through turbid liquids) indicate that whatever makes for clearness of outline enhances the impression of depth; Jaensch's exploratory attention is unnecessary. Depth is also favoured by the appearance of substantiality (Jaensch's *Zwischenmedium*).] **J. S. Szymanski.** 'Versuche über die Entwickelung der Fähigkeit zum rationellen Handeln bei Kindern.' [Children from 5 to 10 were required to sweep the gravel from a small spiral maze. At 9 the correct actions occur in 75 per cent. of the tests.] Literaturbericht. Bd. lxxxii., Heft 5 und 6. **K. Koffka.** 'Beiträge zur Psychologie der Gestalt—und Bewegungserlebnisse: iv. Zur Theorie einfachster gesehener Bewegungen, ein physiologisch-mathematischer Versuch.' [Seeks, on the basis of Korte's laws of the intervariation of spatial separation, time interval and intensity of stimulus as conditions of the perception of visual movement (vol. lxxii.), to answer in a formal way the questions where and when the two excitations meet, *i.e.*, to construct a schematic brain-process from which the laws are derivable.] **R. Prantl.** 'Die Schnelligkeit des optischen Erkennens als Funktion der Objektlage.' [Experiments on the reading of words turned, in the ordinary plane of reading, to the various points of the compass. All deviations from the normal position decrease the speed of reading; the decrease is greatest at 150° and 210° (here the time required is about 4 times the normal); there is a slight recovery at 180° (about 3·7 times the normal). The experiment has a differential significance.] **H. Henning.** 'Prüfung eines Wünschelrutengängers durch eine wissenschaftliche Kommission.' [Test of a patented divining-rod for the discovery of metals, etc., carried out by a scientific committee in the presence of the inventor. All trials made without knowledge, indoors and in the field, gave negative results.] Literaturbericht. Bd. lxxxiii., Hefte 1 und 2. **K. Goldstein und A. Gelb.** 'Ueber den Einfluss des vollständigen Verlustes des optischen Vorstellungsvermögens auf das taktile Erkennen: zugleich ein Beitrag zur Psychologie der taktilen Raumwahrnehmung und der Bewegungsvorstellungen.' [Case of a 24-year-old labourer whose wound (1915) affects the left occipital lobe; the visual phenomena have been dealt with in the *Zeits. f. d. ges Neurologie u. Psychiatrie* for 1918. With eyes closed and body at rest the patient cannot localise at all; by help of twiching movements he 'localises' reflexly without idea of place of stimulation. The resting skin feels two simultaneous pressures as one; with movement there is an æsthesiometric limen. With body at rest the patient cannot tell the position of a limb; he has, however, learned by heart certain characteristic kinæsthetic complexes, and by their aid can argue to a conclusion. With eyes closed he finds extreme difficulty in the execution, and especially in the initiation, of a voluntary movement. He is able, by feeling an object which he does not recognise by touch, to make a very fair drawing of it; he is, however, unable to recognise the drawing, which is not for him a 'copy' of the object, but a spontaneous construction. After discussing these and many other observations of detail, and bringing the results into relation with normal behaviour, the authors distinguish two kinds of 'idea of movement,' the idea of the member to be moved and the idea of the movement itself, ideas which have too often been confused; and thence proceed to a general theory of tactual space. Their thesis is that there is no such thing as a *Tastraum* (cutaneous and kinæsthetic), in

spite of what has been written about the congenitally blind: space gets into our tactual experiences by way of vision, and the only space of experience is therefore visual. A very important paper, which should be read in connexion with that of 1918.] **K. Buehler.** 'Replik.' [Reply to Henning.] Literaturbericht. Bd. lxxxiii., Heft 3 und 4. **H. Friedlaender.** 'Die Wahrnehmung der Schwere.' [Experiments with lifted weights, under the sensory and the objective attitudes. After an analytical description of the experiences, the writer passes to the conditions of the perception. Subcutaneous sensations (probably tendinous) are adequate without cutaneous pressure, and cutaneous pressure alone is also adequate: duration, area, and intensity of stimulus are of importance. On the subjective side, anything that interferes with the normal associative connexion makes against objectification. Discriminative sensitivity is somewhat more delicate in the objective attitude. Objectification depends upon direction of attention to the visual (perceived or ideated) object and a sufficient number of like experiences in the past. It is probable that sensations of all sense-departments may be thus objectified.] **O. Selz.** 'Komplextheorie und Konstellationstheorie.' [Argues, against G. E. Müller, for a fundamental difference between the constellation of the associationists and the complex of the thought-psychologists, and for the justification of the latter concept.] **A. Fischer.** 'Zur Abwehr.' [Reply to Henning and Müller, in behalf of Meinong and Witasek.] Literaturbericht. Bd. lxxxiii., Heft 5 und 6. **E. R. Jaensch.** 'Ueber Grundfragen der Farbenpsychologie: Zugleich ein Beitrag zur Theorie der Erfahrung.—Vorbemerkung. [Plea for greater rigour of method and less indulgence in controversy.] **E. R. Jaensch** und **E. A. Mueller.** 'i. Ueber die Wahrnehmung farbloser Helligkeiten und den Helligkeitskontrast.' [After showing that the phenomenon of transformation (subjective compensation of illumination) is not dependent, as Hering supposed, upon contrast, pupillar variation, and adaptation, the writers prove by a series of 'parallel' experiments that the same laws obtain for transformation as for contrast. For both, *e.g.*, the effect increases proportionally to the white valence of the in-field, save in the region of indifference (subjective equality), where it transcends this proportionality; for both, the subtraction of equal amounts of objective light means the disproportionate reduction of the subjective brightness of the dark-surrounded in-field; for both, equations are unchanged with proportional change of all valences concerned; etc. Theory is to follow later.] **E. R. Jaensch.** 'ii. 'Parallelgesetz ueber das Verhalten der Reizschwellen bei Kontrast und Transformation.' [Katz' law of transformation holds also of contrast: a liminal brightening requires the same increment of objective light, whether the in-field is lightened or darkened by contrast; Katz' inference to constancy of psychophysical intensities is, however, ungrounded.] Literaturbericht.

ARCHIV F. D. GES. PSYCHOLOGIE. Bd. xxxviii., Heft 1 und 2. **J. K. Von Hoesslin.** 'Das Gesetz der spontanen Nachahmung.' [Spontaneous imitation is due to the reproduction (Semon's ecphoria) of analogous ideas by similarity; and the effective moment of 'similarity' is formal synthesis or form-quality.] **H. Schole.** 'Ueber die Zusammensetzung der Vokale *U*, *O*, *A*.' [Experiments on reed-tones, taken down and built up partial by partial (control by tonoscopic discs and smoke-rings), and on sung vowel-transitions (subjective control). The pure tone has a vocal colouring (Kohler). Sung vowels are compound tones of harmonic structure (Helmholtz). The individuality of the

vowel depends, in the first instance, upon the absolute pitch of especially intensive partials (here is a resemblance to Hermann and the formant-theory), whose prominence is due in most cases to reinforcement by buccal resonance, sometimes to the damping of other partials. An important paper, whose results are in general agreement with those reached by Stumpf (also by the method of interference) and reported in the *Berichte* of the Prussian Academy.] **O. Klemm.** 'Untersuchungen über die Lokalisation von Schallreizen: iii. Ueber den Anteil des beidohrigen Hörens. [Experiments leave no doubt that as regards intensive discrimination, temporal discrimination, and judgment of distance, the two ears function together better than (for example) two microphones or other mechanical appliances set at the same distance apart; there is a *Steigerung der Gesamtleistung*. The problem of binaural localisation will find its solution only when this conjoint functioning is understood; the writer sums up what is so far known. In audition, there is no shift of the 'local signs' such as Stratton found for vision.] **H. Werner.** 'Ueber optische Rhythmik.' [(1) Experiments in which a rhythmical motor memory is interrupted, and an actual motor rhythm is complicated, by auditory, tactual and visual series, prove that there is a true visual rhythm; rhythmisation is more difficult than for auditory, easier than for tactual series. (2) The subjective periodicity of regularly recurrent flashes, varied in intensity or duration, depends on the set of the observer. Increase of intensity or time, with apperception of the flashes, means a slowing (optimum, 0·3 to 0·4 sec.), and with apperception of the pauses, a quickening of the series (optimum, 0·7 to 0·8 sec.). (3) The subjective periodicity of an accented visual series depends both upon formal (rising or falling phrase) and upon material set (apperception of light or dark).] **V. Benussi.** 'Anmerkung.' Bd. xxxviii., Heft 3 und 4. **A. A. Gruenbaum.** 'Negative Abstraktion und Nebenaufgabe.' [Reply to the criticisms of Achenbach in vol. xxxv. Primary and secondary instructions are integrated in a determinate order of rank, and negative abstraction is psychologically as positive as positive abstraction.] **A. A. Gruenbaum.** 'Untersuchungen über die Funktionen des Denkens und des Gedächtnisses: iii. Assoziation und Beziehungsbewusstsein; Versuch einer psychophysiologischen Theorie der Reproduktion.' [The doctrine of association takes account of only one type of element, the 'ideas' and like contents, and of only one type of connexion, that which shows itself in the mechanics of reproduction; it cannot do justice even to attention. Physiologically, however, we have regional as well as local activity, a total-factor as well as the particular effect. The dynamic consciousness of relation may be correlated with the intracellular representation of this total-factor and of the processes of conduction in medullated nerve; we have first a conscious predisposition to reproduction, then an undifferentiated consciousness of 'sphere,' and then the play of the associative mechanisms. Association and the act of relation thus reflect stages in the development of a single complex physiological process.] **A. A. Gruenbaum.** 'Untersuchungen über die Funktionen des Denkens und des Gedächtnisses: iv. Assoziation und Organisation; Zur Einleitung in eine Strukturlehre des Bewusstseins.' [Renewal of the critique of associationism, with especial reference to Michotte and Rancy. Psychical connexion is never mechanical; it has the character of 'organisation'. There are two main types of such connexion: the objectively orientated (here, under the cross-headings of material and principle of organisation, we distinguish forms, schemata, relations of reality, and concepts) and the dynamically articulated; they are, however, in the concrete case, as closely interwoven as are contents and functions.] **M.**

Pasch. 'Mathematik und Logik: i. Ueber innere Folgerichtigkeit.' [A narrative may be tested for contradictions of the first order (in or between its sentences) by strict intercomparison of the parts. There is no general test for contradictions of the second order (between two inferences, or between a sentence and an inference). Where possible, we first formalise and then arithmetise the narrative, making arithmetic the court of last resort. But then we should treat arithmetic itself in the same way.] **M. Pasch.** 'ii. Ueber den Bildungswert der Mathematik.' [Modern mathematics is characterised by an extraordinary refinement of procedure, but also by a widespread looseness in the use of concepts; instruction in school and university is therefore largely ineffective.] **M. Pasch.** 'iii. Forschen und Darstellen.' [Plea for rigorous deductive procedure and complete exhibition of the steps of the argument.] **M. Pasch.** 'iv. Der Aufbau der Geometrie.' [The mathematician may be content with a 'hypothetical' geometry. Application demands an empiristic foundation, which must be worked out in full detail.]

ARCHIV F. D. G. PSYCHOLOGIE. Bd. xxxix., Heft 1 und 2. **W. Resch.** 'Zur Psychologie des Willens bei Wundt.' [Traces the development from heterogeny to autogeny, from activity to element, in four stages: (1) the intellectualistic background; (2) the approximation to the reflex and the bracketing of will with apperception; (3) discrimination from the reflex and insistence of the affective nature of will and apperception; and (4) the processes of will as affective courses with the background of the doctrine of elements.] **J. Wittmann.** 'Die Invertierbarkeit wirklicher Objekte.' [Historical survey; record of experiments, binocular and monocular. Burmester's theory of perspective involution will not hold water: the conversion is not necessarily either unequivocal or complete. Wundt's fixation-theory is also untenable. Observations on colour and light-and-shade correct Mach and Burmester; observations on objectivity in the main confirm Wheatstone.] **P. Mueller.** 'Verlauf einer vorbereiteten Willensbewegung.' [Reactions to the transit of an artificial star (stroboscopic arrangement). Continuous record of the key-pressure and extinction of the light at different points of its course permit the ascertainment of the two temporal limens of disturbed and undisturbed reaction. With the anticipatory attitude, the difference between these limens (the duration of the development of the impulse) averages 64 σ, irrespective of the star's rate of movement and distance from the meridian; with the reactive attitude the limens coincide.] **H. Lehmann.** 'Kulturpsychologie und Geschichtstheorie (im Umriss).' [Syllabus. In spite of the lack of continuity and individuality, the attribution of motive in psychological terms is the only method of pre-history.]

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